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FIRST AERO WEEKLY IN THE WORLD.

FLIGHT

APR 30 1933

The AIRCRAFT ENGINEER AND AIRSHIPS

OFFICIAL ORGAN OF THE ROYAL AERO CLUB.

No. 1264
Vol. XXV
No. 11

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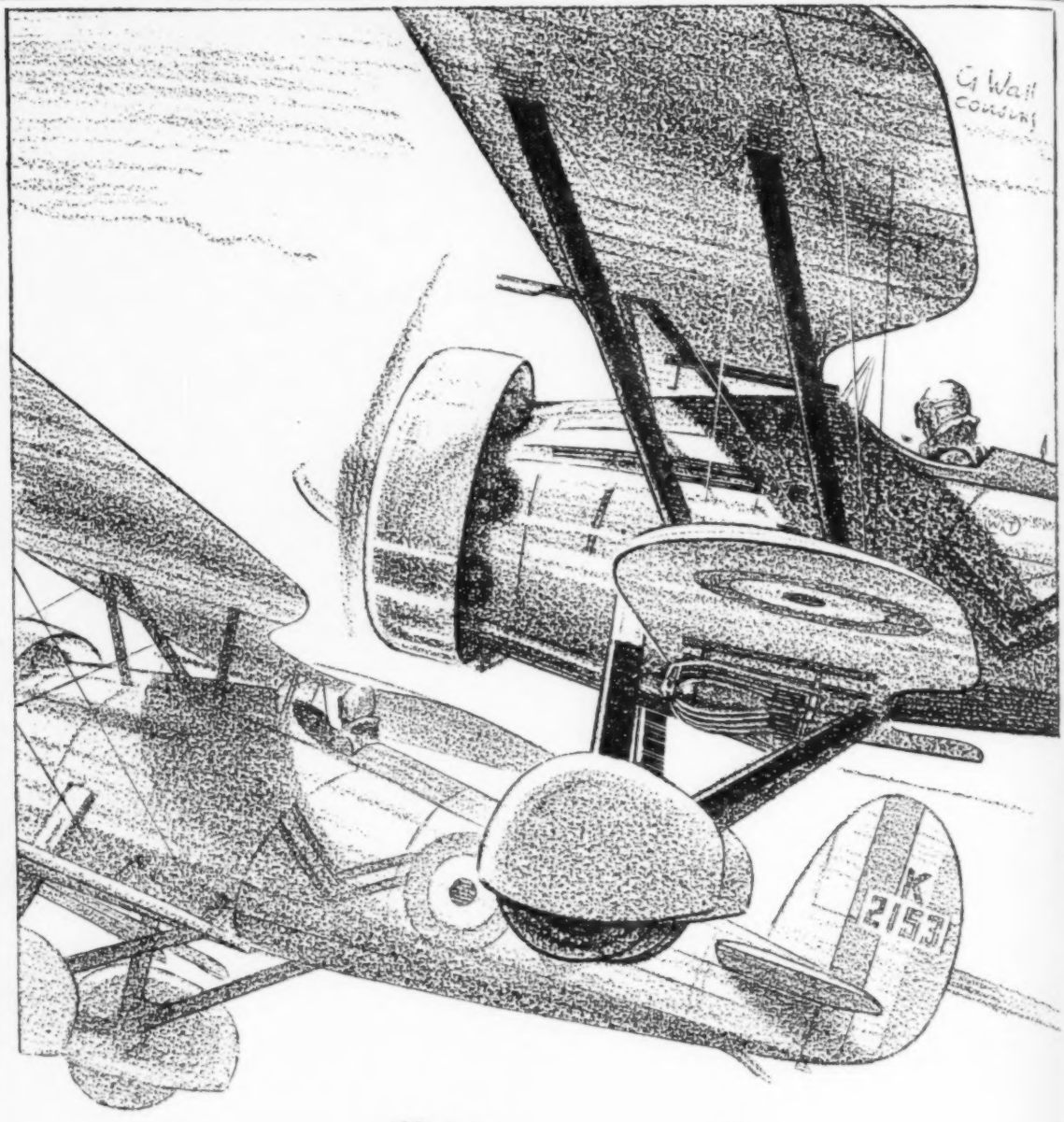
EVERY THURSDAY



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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

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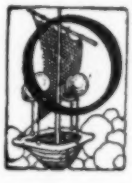
DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1933.

Mar. 16. "Work of the Central Aerodynamic Institute, Moscow," Lecture by Prof. A. Toupoleff before R.Ae.S.
Mar. 22. "The Value of Aircraft for Protecting Seaborne Trade." Lecture by Air Commodore C. D. M. Robertson, before R.U.S.I.
Mar. 24 No. 1 Sqdn. R.A.F. Reunion Dinner, at R.A.F. Club.
Mar. 24. Bristol and Wessex Ae.C. Dance at Grand Spa Hotel.
Mar. 25. Lloyd's Register C.C. Reunion Dinner, May Fair Hotel.
Mar. 25. Services Rugby: R.A.F. v. The Army, Twickenham.
Mar. 29. "The East African Dependencies." Lecture by H. F. Melland before R.U.S.I. Chairman, Air Vice-Marshal Sir V. Vyvyan.
Mar. 29. Royal Aero Club Annual General Meeting, 8.30 p.m.
Mar. 29. Norfolk and Norwich Ae.C. Annual Dinner, Spring Gardens, Norwich.
Apr. 1. Women's R.A.F. Dinner, Criterion Restaurant.
Apr. 6. "Lessons of the Do.X," Lecture by Dr. C. Dornier before R.Ae.S.
Apr. 27. "Seaplane Research," Lecture by H. M. Garner before R.Ae.S.
Apr. 28. Junior Ae.C. Dinner to Sqd. Ldr. Gayford and Flt.-Lt. Nicholetts.
May 10. Kent Air Pageant and Opening of Maidstone Aerodrome.
May 16-22. International Rally, Vienna.
May 25. Tourist Rally at Wiesbaden.
May 27. Reading Ae.C. Annual "At Home."
May 28. Deutsch de la Meurthe Cup.
May 30. Wilbur Wright Memorial Lecture before R.Ae.S.
June 5. Lincs. Ae.C. Air Pageant and Opening of Aerodrome at Holton-le-Clay, Grimsby.
June 5. Skegness Flying Meeting.
June 7. Household Brigade Flying Club Meeting.
June 24. Royal Air Force Display, Hendon.

EDITORIAL COMMENT



ONCE more the Air Estimates are a disappointment to all patriotic—no, prudent is the better word—citizens who wish to see Great Britain safe in the air. Safety is the minimum and primary requirement of all communities, and so we mention it first; but actually there are other reasons for wishing to see an expansion of flying in all directions. The British Empire has its needs, some of which can only be met by extending the use of aircraft, while in other cases economy and efficiency could both be served by making more use of aircraft in place of other agencies. None of these desirable objects can be fully achieved unless certain conditions are fulfilled. One of these conditions is a constant growth of what is called airmindedness. The word has come to smack rather of journalese; what is meant is a growing trust in aircraft, an appreciation that they are no longer toys but a very real element in the life of the present and the future. Another condition is that our aircraft industry must be in a flourishing condition, free from anxieties about bread and butter, and able to throw itself heart and soul into the improvement of the things which make flying not only possible but worth while. To produce such a state of affairs and to maintain it needs some expenditure of money, and at present this money must, to a certain extent, be found by the State. To be over-rigidly economical towards our aircraft industry is to threaten with starvation the goose which lays golden eggs.

The Air Estimates

The net Air Estimates for the coming year are, as the Secretary of State explains in his memorandum, actually lower than those of 1932-33 by nearly £340,000. Net Estimates, we may remind our readers, are the amount which the House of Commons has to provide for the Air Ministry after allowing for the appropriations-in-aid, or contributions, by other Government Departments or outside agencies. Previously the Vote for Colonial and Middle Eastern Services contributed upwards of £360,000 towards the Air Estimates. In the coming year the Air Ministry will have to provide that sum

itself. The Admiralty always pays for the cost of the Fleet Air Arm, and the payment is called an appropriation-in-aid. That the War Office does not contribute the cost of the army co-operation squadrons and the School of Army Co-operation always appears to us an injustice. In time of war these units would be at the entire disposal of the Army and would add nothing to what may properly be called air strength.

As a general rule, we regard the net Estimates as the more profitable subject for examination, but this year we must express our delight at some items in the gross Estimates. The appropriation-in-aid paid by the Admiralty in respect of the Fleet Air Arm towards the purchase of "Technical and Warlike Stores" amounts to £870,000, which is an increase of £60,000. Various flights of the Fleet Air Arm are being re-equipped with modern types of ship-plane and seaplane. The Naval Estimates point out that steady progress is being made in the installation of catapults, and that fifteen have now been fitted in cruisers and capital ships. This is a welcome offset to the decrease of £2,000 in the provision for the purchase of aeroplanes, engines and spares for the other branches of the Royal Air Force. The appropriation-in-aid from the Government of India also shows a welcome increase of £70,000. Evidently the squadrons on the Indian establishment are not to be allowed to fall into the parlous state in which they were a few years after the Armistice. Though the time has not yet come, and possibly never will come, when the Royal Air Force can take over the work of the Army in India, it has in recent years been able to give better proof of its efficiency in mountain warfare than once seemed probable. The recent flight to Gilgit, of which photographs were published in FLIGHT, showed how modern engines can overcome the dangers of one of the most difficult terrains for flying in the world. Obviously, however, the equipment in India, even more than in flatter countries, must always be of the very best. To sum up, the amount to be spent on aircraft, engines and spares is only very slightly less than was provided in the Estimates of a year ago. The savings on research are, however, heavy. One Flying Training School is to be closed down. Things might be much better, but, in these days of penury and Geneva, perhaps we must be thankful that they are no worse.

That no provision has been made in these Estimates for the formation of another squadron of flying boats is a disappointment. There is no form of aircraft which can be described by the pacifists as less aggressive than the flying boat. Certainly they may be very useful in countering submarine attacks on our commerce, and whether that function comes under the heading of offence or defence we leave it to the non-experts of Geneva to define. In the main, however, the British Empire needs flying boats for official communications, for police work in disturbed Eastern waters, for experiment and research on the type, and for surveying civil air routes. The Basra squadron did the preliminary survey of the Arabian coast of the Persian Gulf for Imperial Airways, and the squadron at Singapore has been engaged on similar work for the extension of the air-mail service from India to Australia. Another squadron of boats would be very welcome. It is to be hoped its formation has only been postponed until a suitable new type of boat has emerged as the result of the present Air Ministry competition.

We must still regard the Command, Air Defence of Great Britain, as the heart and soul of the Royal Air Force. Here no increase is to take place. As the Secretary of State put it, "The modest Home Defence programme of 1923 is held in suspense for another year. . . . The Home Defence Force still embodies only 42 of the 52 squadrons of the original programme; and of these 42, 13 are non-regular." Although we could hardly look for much expansion in present circumstances, the decision is none the less deplorable. At this point it will be pertinent to quote what *The Times* has to say on the subject. The opinion of FLIGHT may be regarded as biased, but that of the premier London daily is certainly impartial. In its leading article of March 9 *The Times* wrote:—

> "The air fleets of minor European Powers, such as Yugoslavia and Czechoslovakia, are more nearly comparable in strength to the British than the British is to the French or American or Japanese. It is not a pleasant position, however sure we may feel that peace is assured for years to come or however anxious we may be to keep out of any conflict that may unfortunately arise. We are particularly vulnerable from the air, and air communications are rapidly becoming as vital as sea communications to the safety of our scattered territories."

Surely we could afford to add some more non-regular squadrons. They are extraordinarily efficient, and they are very cheap. The whole cost of these 13 squadrons, including the pay of the regular element that works with them, and also including the cost of the Royal Air Force Reserve, amounts only to £464,000 for the coming year. The cheapness is astonishing. Incidentally we are glad to note that the Estimates make provision for founding a new body, the Auxiliary Air Force Reserve. Already the services of many good officers have been lost when they have completed their engagements with the active A.A.F. and have not felt able to renew them. On the A.A.F. Reserve they will still be useful to their country and be able to keep up their flying.

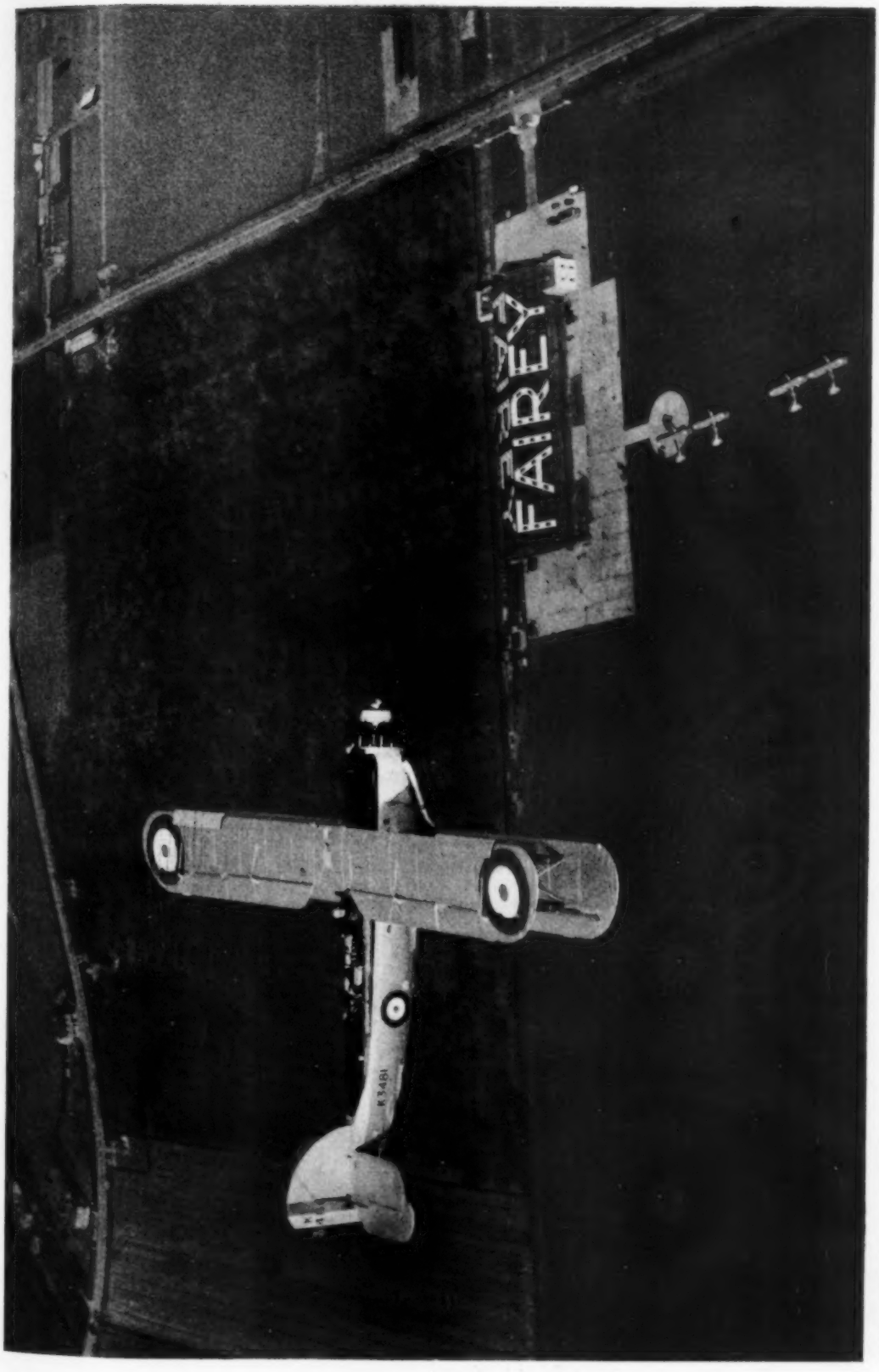
The vote for Civil Aviation shows a net increase of £17,000, but the figure means little without examination. The cost of opening up the Arabian route down the Persian Gulf is now a thing of the past. Provision is made, however, for extending the England-India service to Singapore, where it will come under the auspices of the Australian Government. Light aeroplane clubs are to receive £20,000 in the coming year as against £8,500 in the past year. Once more we must hope that the Estimates a year hence will show more appreciation of the vital importance of aircraft to our safety and our commerce.

British Coal Petrol

IT is announced that the Air Ministry have placed an order for 12 months' supplies of aviation petrol made from British coal with the Low Temperature Carbonisation, Ltd. The petrol, it is stated, is being used by a fighter squadron. The managing director of the producing firm is Lt. Col. W. A. Bristow.

Japanese Air Services on the Mainland

THE special correspondent of the *Daily Mail* in Manchuria reports that the Japanese have instituted a first-class aerial transport system extending the whole length of rugged Korea into Manchukuo, with line aerodromes and well-disciplined staffs and comfortable waiting rooms where tea is served gratis.



THE AEROPLANE VERSION : A Fairey "Seal" ("Panther" engine) piloted by Mr. Staniland flying above the Fairey aerodrome. Another version for the Fleet Air Arm is fitted with floats. (FLIGHT *Photo.*)

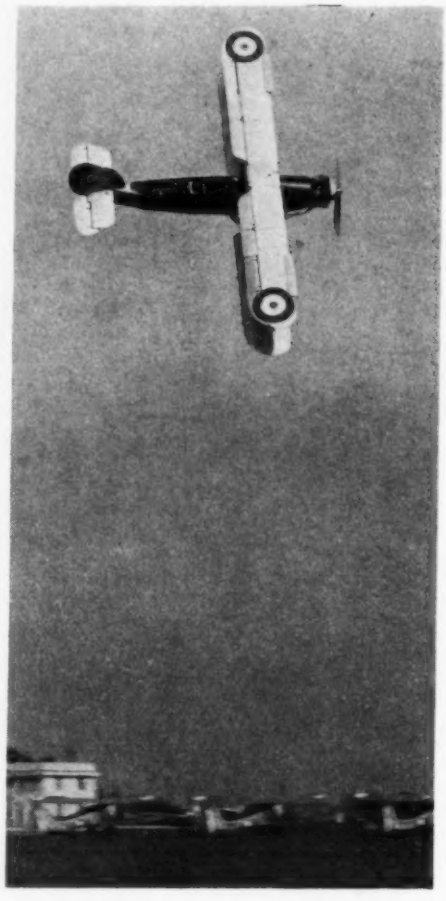
The Fairey "Seal"

New Type for Fleet Air Arm

THE first public appearance of the new Fairey "Seal" was made on March 10 at the Fairey aerodrome at Harmondsworth, when Flt. Lt. C. Staniland and Lt. S. H. G. Trower, R.N., flew two of the new machines. Staniland demonstrated very effectively the manœuvrability and performance of the machine, which was quite remarkable for an aeroplane of some 6,000 lb. weight, while Mr. Trower's rôle was mainly confined to acting as aerial chauffeur for a number of press photographers bent upon getting pictures from the air.

A strong family resemblance links the "Seal" with such earlier famous types as the III F and "Gordon," but many detail differences are to be found if the "Seal" is examined closely. For example, the tail has been redesigned and is no longer of the typically Fairey shape. Frise ailerons are used, and altogether the controls are claimed to be nearly as light as those of a small single-seater. The hinged trailing edge flaps used for varying the camber of the wings have been retained, and Staniland gave a convincing demonstration of their effectiveness by flying extremely slowly across the aerodrome at low height.

As a Fleet Air Arm machine the "Seal" is, of course, a three-seater, and can be used for bombing, fighting, reconnaissance, gunnery spotting, photography, etc. It is of all-metal construction and incorporates features already well tried in hundreds of Fairey III F and other types. The fuselage is a tubular structure of steel, welding being employed for making joints. The particular method of welding used by the Fairey Aviation Co. is based upon welding the vertical and horizontal struts together into a rectangle, on each corner of which is a small curved plate on which the longeron rests, and to which it is pinned. In this way the cheapness and rapidity of welding is fully exploited, while at the same time no stresses of any magnitude are taken by a welded joint working in tension. In the forward portion of the fuselage pinning or bolting is used for assembling, and the "spools" which were a familiar feature of Fairey wooden machines are retained in the "Seal," these spools serving as very neat and convenient centres on which to converge a number of structural members.



MANŒUVRABILITY: Flt. Lt. Staniland demonstrating the Fairey "Seal" ("Panther" engine) at Harmondsworth. (FLIGHT *Photo.*)

The large-span biplane wings of the "Seal" are also of metal construction, and have main spars of "double-eight" section to which the very simple ribs are attached by friction straps, which avoid piercing the spar with holes and also make it possible to locate the ribs anywhere on the spar without previous laborious jig work for drilling holes. As a production job the Fairey wings as used on the III F and "Seal" are just about as simple as anything could be, but the simplicity has not been arrived at except at the expense of very extensive tooling and jigging. The enormous numbers of III F's delivered to the R.A.F., the Fleet Air Arm and to foreign air services has made real mass production methods possible, and these are utilised to the full in the building of the new "Seals."

The Armstrong-Siddeley "Panther" engine is mounted on a very neat engine ring, formed

FOR THE FLEET AIR ARM: Some of the Fairey "Seals" (Armstrong-Siddeley "Panther" engine) lined up at the Fairey aerodrome. (FLIGHT *Photo.*)

of a tube bent to circular shape and carrying a number of brackets welded and pinned on, in which are drilled the holes for the engine supporting bolts.

As a Fleet Air Arm machine the "Seal" is liberally supplied with flotation bags, of which there is one large bag in the rear portion of the fuselage, a slightly smaller in the forward part, and an inflateable rubber dinghy folded and stowed in the upper starboard wing, just outside the centre-section. Additional flotation is provided by the main petrol tank in the fuselage, which has a jettison valve which enables the tank to be emptied quickly in case of emergency.

Both a landplane and a floatplane version is produced for the Fleet Air Arm. The landplane is for operation from aircraft carriers, and is fitted with Dunlop wheels and Bendix brakes. The seaplane version is of the twin-float type, the floats, like all the rest of the machine, being designed and built at the Hayes (Middlesex) works of the Fairey Co. A feature of the floats is that much of the riveting is done externally. That is to say, where the float top joins the chines the two are flanged *outwards*. This makes the riveting very accessible, and as the rivets have both ends exposed to the air they dry very quickly and corrosion risks are reduced. In the construction of wings and fuselage also, every precaution against corrosion is taken. All steel parts are protected by being Cadmium plated, while aluminium and Duralumin members are anodically treated.

One of each type of "Seal" is at present being tried out under service conditions on the spring cruise of the Royal Navy. The landplane version is on board the aircraft carrier *Courageous*, while the floatplane machine is on the *Valiant*. The latter machine is fitted with stubs for catapulting.

The Fairey "Seal" has a wing span of 45 ft. 9 in. The gross weight of the landplane is just under 6,000 lb., while the floatplane weighs approximately 6,400 lb. loaded. The normal range is in the neighbourhood of 600 miles, but by fitting outboard petrol tanks in place of the bombs this range can be very considerably increased.

SLOTTED AND FLAPPED: The Fairey "Seal" ("Panther") is fitted with Handley Page automatic wing tip slots and Fairey trailing edge flaps. The ailerons are of the Frise type. (FLIGHT *Photo.*)

SIR MALCOLM CAMPBELL'S RETURN

SIR MALCOLM CAMPBELL, who recently established a world's land speed record on his Rolls-Royce engined Bluebird motor car when he travelled at 272.108 m.p.h. on Daytona Beach, reached Southampton in the "Aquitania" on March 8. He was met by a fleet of eighteen speed boats, which had been organised by Mr. Hubert Scott Paine. Mr. Scott Paine himself led the fleet with one of his 37 ft. twin-screw R.A.F. crash boats, and took out with him Lady Campbell and her son. Several aircraft also greeted the liner on her passage up Southampton Water. On Friday evening Sir Malcolm was the guest of honour at a dinner given by the proprietors of the *Daily Mail* at the Dorchester Hotel, London. Over 400 guests from the aviation and motoring world were invited to welcome him, and the assembly was presided over by Sir George A. Sutton, who read out a telegram from the Prince of Wales congratulating Sir Malcolm on his safe return "and the pluck and persistence which has enabled him to establish yet another wonderful record for this country."

Earl Howe proposed Sir Malcolm's health in an apt and witty speech, bringing out the amazing courage Sir Malcolm has shown during the obtaining of no less than ten world's records. Earl Howe made a very apt remark indeed in introducing Sir Malcolm as a Prince of Sportsmen when he said that our best ambassadors are always our sportsmen.

In reply Sir Malcolm, after acknowledging his indebtedness to Lord Wakefield, gave an interesting account of his latest success. He gave many details of the "Bluebird" itself and of the Rolls-Royce engine which carried it to victory. For example, he had such faith in the engine that at one time he let it out to 3,700 r.p.m. The "Bluebird" was built to the designs of Mr. Railton by Thompson & Taylor, Ltd., the well-known firm who incidentally also do a considerable amount of aero engine work at Brooklands. Hardly less important than any other part of the machine were the tyres, and for those products of the Dunlop factory Sir Malcolm could not find words to express his admiration. He was loud in his praise also of the work put in by his staff of mechanics, for, as he pointed out, without their loyal support he could never have succeeded.

After the dinner there was an admirable cabaret given by such well-known artistes as Mr. Tom Burke, Miss Ann Penn, Mr. Gillie Potter and the Western Brothers, while the Sydney Baynes Light Orchestra provided music throughout the evening. Among those present were:—The Lord Mayor and Lady Mayoress and the Sheriffs, Lady Campbell, the American Consul-General, Sir George Beharrell, Mr. S. J. Bell, Sir Henry Birkin, Sir Harold Bowden, Lord Brecknock, Sir Stenson Cooke, Wing Com. Sir Louis Greig, Sir William Letts, Mr. Standish Mitchell, Sir Henry Norman, Wing Com. A. H. Orlebar, Mr. P. J. Pybus, M.P., Mr. R. A. Railton, Lord Henry Scott, Mr. A. F. Sidgreaves, Sir Arthur Stanley, Flt. Lt. C. F. Uwins, Sir Alliott Verdon-Roe, Lord Wakefield, and Sir Alan Cobham.

Royal Aeronautical Society Gold Medal

THE Council of the Royal Aeronautical Society has awarded the Society's Gold Medal to Sir Richard Glazebrook, K.C.B., F.R.S., Fellow of the Society. The Gold Medal is the highest honour which the Society can confer. It has only been awarded six times previously, to the Wright Brothers, Mr. Octave Chanute, Prof. Bryan, Mr. E. T. Busk, Prof. Lanchester and Prof. L. Brandtl. Sir Richard Glazebrook has been Chairman of the Aeronautical Research Committee since its foundation in 1909 (as the Advisory Committee for Aeronautics) and is retiring from the position in April next.

THE N.P.L.'s NEW DENSITY TUNNEL

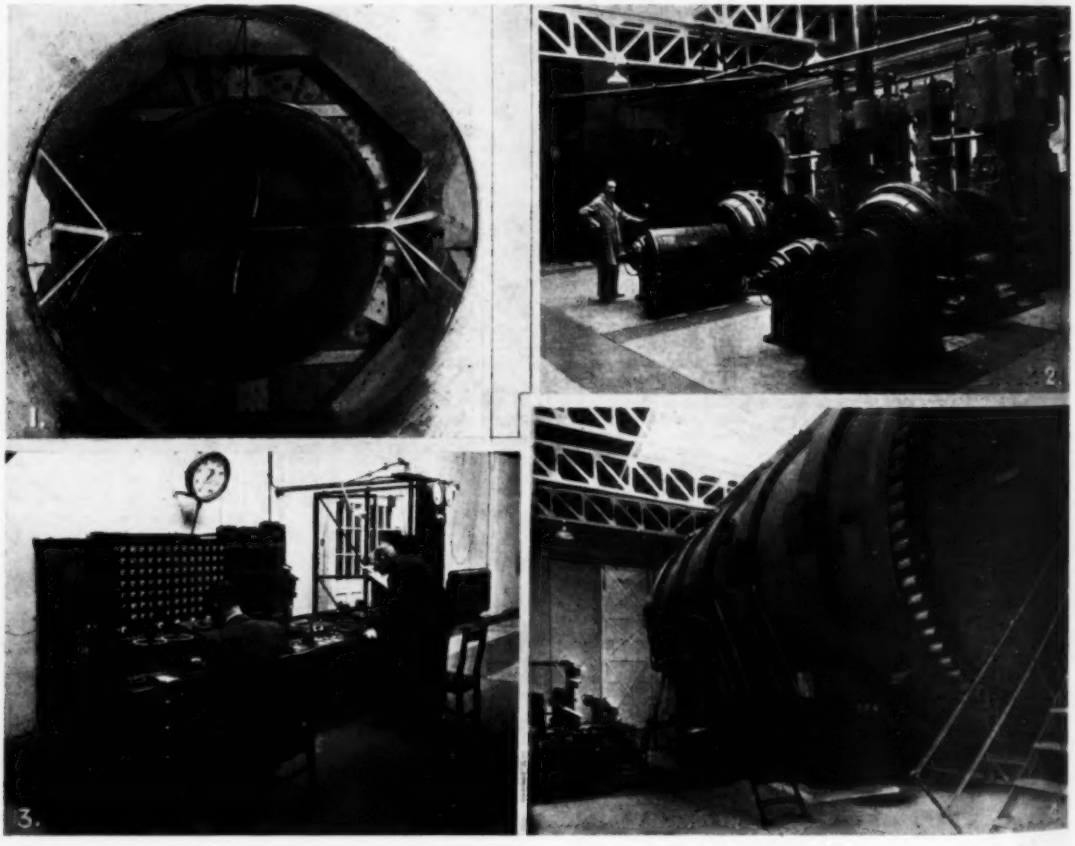
THE compressed air tunnel which forms the most recent addition to the equipment of the Aerodynamics Department of the National Physical Laboratory at Teddington was demonstrated before representatives of the Press on March 13. The new tunnel is similar to, but larger than and incorporating improvements on, the compressed-air tunnel constructed for the American National Advisory Committee for Aeronautics some years ago. With true British caution our aerodynamicists were a little sceptical as to the value of the high-density tunnel, and it was decided to " wait and see." The American tunnel proved its worth long ago, and filled a gap at a time when America had not yet constructed her huge wind tunnels in which at any rate the central part of a full-size aircraft can be tested with engine running. A slightly smaller full-scale tunnel is now being constructed by Boulton & Paul, Ltd., for the R.A.E.

Space does not permit of going into the technical whys and wherefores of the density tunnel, beyond pointing out that its *raison d'être* is to provide against " scale effect." This, in non-technical language, is the product of model size and air speed. The new density tunnel at the N.P.L. is designed to work at a maximum pressure of 25 atmospheres and at an air speed of 60 m.p.h. This means that with a model one-tenth full size the conditions are exactly similar to those of a full-scale machine flying at 150 m.p.h. So far no model tests at the full 25 atmospheres have been made, the work hitherto having been largely confined to tests of the tunnel itself. Gradually the pressure is being increased, and among the first real model work to be carried out will be tests on frequently-used wing sections. Another set of experiments will consist in tests on a model wing, for comparison with tests on a full-size wing on an actual aircraft.

The density tunnel consists of a wind tunnel housed inside a steel shell. The air is circulated by a 400-h.p. motor, and the air is compressed into the shell by three 400-h.p. compressors housed in an adjoining room. These compressors are capable of charging the shell to the full pressure in about 90 min. At this high pressure the observer cannot, of course, work inside the tunnel, and novel electrical apparatus had to be designed which transmits the readings to a point outside the tunnel. The general principle employed is that the air forces to be measured are balanced by electromagnetic forces between coils of wire, the current in which is controlled from outside and the magnitude of the current required for balance being a measure of the forces.

The outer shell of the density tunnel was designed and made by John Brown & Co., Ltd., of Sheffield. It has a diameter of 17 ft. and is 50 ft. long. With the internal tunnel, also made of steel, the total weight is 310 tons. The thickness of the shell is 2½ in., and it is formed of four rings, each weighing about 20 tons, jointed together by circumferential straps fitting over flanges on the ends of the rings. The ends of the shell are steel castings of hemispherical form. A special labyrinth packing prevents leakage past the shaft from the fan to the external motor.

When the pressure is being released, the whole of Teddington can hear it! We gather that it is intended later to arrange for the released air from the density tunnel to be used for working a smaller tunnel.



THE DENSITY TUNNEL AT THE N.P.L. : 1 is an internal view, showing the fan and the model wing being tested. 2 shows the air compressors and their generators, while in 3 is seen the instrument board from which the settings of the model are controlled, and on which the forces are read off. A general view of the tunnel and instrument board is given in 4. (FLIGHT *Photo.*)

A NOT-SO-MYTHICAL DRAGON

THE Dragon of old was a slimy, mythical creature which crawled upon the earth on its belly, was a definite danger to the public and found it necessary to attack a poor innocent knight, handicapped by heavy armour and a long pointed pole, in order to attract sufficient advertisement to its unpleasant self.

The modern version of the Dragon is clean-limbed, flies through the air on very capable wings, needs no advertisement other than its own performances, and should prove very useful to society by providing cheaper rates for aerial travel; and what is, perhaps, more important, a machine which gives a great degree of safety.

On March 9 the de Havilland "Dragon" gave another very conclusive proof of its reliability. Leaving Stag Lane Aerodrome at 9.25 in the morning, the machine, piloted by Capt. H S. Broad, flew to Southampton with six passengers, 60 lb. of luggage, two cameras and one umbrella. On the journey south the machine cruised at a steady 108 m.p.h., the two "Gipsy Major" engines revving at about 1,900 r.p.m. On arriving over Southampton, Capt. Broad circled over the *Berengaria* and *Olympic*. Then to show these slow-going ships of the ocean something of the capabilities of their aerial sisters, he switched off the port engine, which, however, did not seem over keen to cease from its normal legitimate work. In fact, only after a little gentle coaxing in the nature of doing a right-hand turn and reducing the speed of the machine to practically stalling point, was the propeller persuaded to stop. Thereafter it merely advertised its presence by a few half-hearted kicks.

THE DRAG ON THE "DRAGON": This photo, taken during flight, shows the left "prop" stopped, as mentioned in the accompanying article. (FLIGHT *Photo.*)

SNAPPED IN THE "DRAGON": Capt. H. S. Broad at the wheel "somewhere over England." (FLIGHT *Photo.*)

The "Dragon" was then headed towards London, flying on the starboard engine alone, which was doing about 2,000 r.p.m. Capt. Broad climbed the machine up about 400 ft., which he had lost in his efforts to stop the port engine, and flew back to Stag Lane at a speed of 78 m.p.h. On arriving over the aerodrome the port engine was started by diving the machine up to 130 m.p.h. and Broad landed with both engines working.

During the flight back to London there was a noticeable increase in vibration, and the machine was obviously under-powered. The feeling was much the same as that experienced by a Service pilot flying a heavily-laden machine through thin air; but this is hardly surprising. The fact remains that the de Havilland "Dragon" is capable of flying level on one engine with practically full load, which is an excellent performance considering that the thrust horse-power of the one engine is reduced to about 80, and the throttle was not fully advanced. Neither must it be forgotten that the trip was of 45 min. duration. From a point of view of safety alone, this means that if one engine suddenly cuts out dead, the pilot has the duration of his petrol in which to find a suitable landing ground. The speed of the machine is only reduced from 108 to 78 m.p.h. De Havillands certainly have produced a commercial machine of outstanding cheapness, efficiency and safety.

At St. James's Palace

A LEVÉE was held on March 7 at St. James's Palace by H.R.H. the Prince of Wales on behalf of His Majesty the King, when the following were amongst those present:—Air Chief Marshal Sir E. Ellington, Principal Air Aide-de-Camp; Lord Londonderry, Secretary of State for Air; Marshal of the Royal Air Force the Lord Trenchard; Group Capt. L. A. Pattinson, Aide-de-Camp in Waiting. Amongst those presented to His Royal Highness were:—Lt. Com. G. D. Murray, U.S. Assistant Naval Attaché (Aviation); Lt. de Vaisseau Albertas, French Air Attaché; Capitano E. T. della Floresta, Italian Air Attaché; Group Capt. P. Babington, M.C., A.F.C.; Flt. Lt. F. Bond; Flt. Lt. I. Brodie; Sir C. Bullock, K.C.B., C.B.E.; Flt. Lt. W. Campbell; Flt. Lt. N. Carter; Flt. Lt. G. Clifford; Flt. Lt. W. Cooper; Wing Com. C. Darley, C.B.E., A.M.; Flt. Lt. E. Davis; Flt. Lt. W. Deane; Air Marshal H. Dowding, C.B., C.M.G.; Flt. Lt. E. Fullerton, Royal Canadian A.F.; Flt. Lt. J. Gillan; Sqd. Ldr. I. Grantham; Flt. Lt. S. Hardy; Flt. Lt. J. Hawkings; Flt. Lt. A. Holmes; F/O. G. Iles, R.A.F. Special Res.; Flt. Lt. V. Jackson; Air Vice-Marshal P. Joubert de la Ferté, C.M.G., D.S.O.; Flt. Lt. E. Lart; Flt. Lt. H. Mellor; Group Capt. L. Pattinson, D.S.O., M.C., D.F.C., A.D.C.; Sqd. Ldr. C. Porter; Flt. Lt. M. Ridgway; Flt. Lt. C. Stevens; Flt. Lt. L. Stewart; F/O. N. Tangye, A.A.F.; Flt. Lt. B. Thynne, A.A.F.; F/O. G. White; F/O. G. Worth, R.A.F. Special Res.

An Air Ministry for Ireland?

THERE has been some considerable discussion in Dublin lately, writes our Irish correspondent, as to the possibility of the early establishment of a Department of Civil Aviation by the Irish Free State Government. At the present time civil aviation is controlled by the Director of the Transport and Marine Branch, Department of Industry and Commerce. The name of Maj. Gen. Hugo McNeill, Assistant Chief of Staff of the Free State National Army, was mentioned as the likely Controller of the Department, but when interviewed he strongly denied the rumour. It is to be anticipated, however, that the Government, who are keen for the rapid development of all services and industries in the country, will shortly put the control of aviation under a separate Ministry. Military aviation is, of course, under the charge of the Minister for Defence, but is directly administered from General Headquarters, Dublin, by Commandant G. J. Carroll, Director of Military Aviation, who was formerly Officer Commanding the Free State Air Corps at Baldonnel Aerodrome.

Air Transport

THE ROYAL NETHERLANDS INDIAN AIRWAYS

Annual Report of K.N.I.L.M. for 1932

WE have received from the Royal Netherlands Indian Airways (K.N.I.L.M.) the following Annual Report for 1932 regarding the air services operated by this company in the Dutch East Indies.

The passenger and freight traffic on the regular services declined owing to the economic crisis. It only decreased, however, to the same extent, or even less, as did surface transport. Moreover, the traffic improved gradually in the course of 1932. From this the conclusion can be drawn that traffic in Netherlands India has proved to be an indispensable factor in this colony. Although lower, therefore, the figures give reason for satisfaction. The specified returns are as follows:—

Route	Passengers	Goods kg.	Mails and Parcels kg.
Batavia–Bandoeng (bi-daily)	3,410	21,224	815
Bandoeng–Batavia (bi-daily)	3,403	21,241	980
Bat.–Semarang–Sourabaya (daily) ..	1,425	4,512	5,213
Sourabaya–Sem.–Batavia (daily)	1,437	5,637	3,251
Bat.–Palembang–Singapore (weekly) ..	235	6,100	529
Sing.–Palembang–Batavia (weekly) ..	226	848	542
Bat.–Pal.–Pakanbaroe–Medan (weekly) ..	297	5,029	6,515
Medan–P. Baroe–Palembang–Bat. (weekly)	235	1,234	1,552
Singapore–Medan (suspended 1.2.32) ..	5	43	24
Medan–Singapore (suspended 1.2.32) ..	8	118	23
Special and Joyflights	7,985	—	26
Total	18,666	65,986	19,470

The results of the weekly service Singapore-Medan remained below expectation and this line was therefore suspended on February 1, 1932.

Owing to the continued unfavourable financial conditions, the Netherland Indian Government was unable to allow funds for the construction of new landing fields. The opening of new lines had, therefore, to be postponed until better times. However, where no considerable expenses were involved, the reconnaissance and study of new lines were continued.

Negotiations with the Australian Government were opened in co-operation with the K.L.M. (Royal Dutch Air Lines) regarding linking up Australia with the weekly service from Netherlands India to Europe operated by the K.L.M. The K.N.I.L.M. would have operated the Batavia-Australia section, thus creating a fast weekly connection between Australia and Europe.

The negotiations were based on the intensive trade connections between Australia and Netherlands India and on the possibility of securing additional load for the K.L.M. planes. As the K.L.M. planes on the Batavia-Amsterdam service generally have space available, it was possible to make a very attractive offer. The proposal was, however, rejected by the Australian Government, as the Government decided to open, towards the end of 1933 or beginning of 1934, an all-British line through co-operation of Australian and English air companies.

Air Fleet

New aeroplanes were not ordered in 1932, and Fokker PK-AFE was wrecked in the jungle during an advertising flight over Bali. The K.N.I.L.M. fleet consisted on December 31, 1932, of two Fokker aeroplanes, F. VIIb (three Bristol "Titan" engines each); four Fokker aeroplanes, F. VIIb (three Armstrong-Siddeley "Lynx" engines each); two Fokker aeroplanes, F. XII (three Pratt & Whitney "Wasp" engines each).

The F. VIIb accommodates eight passengers, and has a cruising speed of 100 m.p.h.; the F. XII is a 16-seater, with an average speed of 120 m.p.h. Aeroplanes as well as engines gave the utmost satisfaction, which is shown by the almost perfect punctuality on all lines.

Regularity of Service

The regularity of service was 100 per cent. on all lines except on the Batavia-Bandoeng service, where it was 99.68 per cent. Twice it was impossible to enter the Preanger Highland in the afternoon on account of bad weather.

In 1932, 2,931 flights were made in 5,284 hr., in which 858,358 km. were covered. The total distance flown since the opening of the air services is 3,130,398 km. and 961,057 ton/km. were accounted for.

Assistance was rendered by the K.N.I.L.M. to a number of private flyers, mostly on their way to or from Australia.

Fares, etc.

With the object of favouring regular air passengers, from September 1, 1932, return tickets were issued, of which the price was about 15 per cent. below twice the single fare. As far as can be judged, the return tickets stimulated traffic; towards the end of the year about 50 per cent. of the passengers made use of them.

The reduction in the extra baggage rates was favourably received. As from September 15 every passenger has a free allowance of 20 kg. For the next 20 kg. half the rates are charged. Only if more than 40 kg. are carried do the full rates come into effect.

A further improvement was the granting, conditionally, of stop-over facilities on all lines. Weather conditions and the state of the landing fields permitting, the K.N.I.L.M. made intermediate landings, on request, on the Sourabaya line at Kali Djati, Cheribon, Togal and Pekalongan, and on the Singapore line at Muntok.

Among notable travellers on the K.N.I.L.M. were H.E. the Governor-General, who travelled from Sourabaya to Semarang and thence to Batavia, and the Crown Prince of Belgium, who again also made use of the K.N.I.L.M. services.

Freight and Air Mail

The trade in fresh-cut flowers showed a sharp decline in 1932, and accordingly the amount carried by the K.N.I.L.M. from Bandoeng to Batavia and Palembang and from Sourabaya to Semarang and Batavia decreased heavily. The transport of flowers from Java to Singapore increased, however. Due to the general depression, the forwarding of occasional consignments also suffered.

Generally, the amount of letter mail was about stationary. The weekly K.L.M. service Batavia-Amsterdam caused a decline in the mail carried by the K.N.I.L.M. from Batavia to Medan in connection with the mailboats for Europe. On the Batavia-Bandoeng line an increase is shown. On all lines together more than 1,300,000 letters were carried.

The carriage of parcel mail by air was opened on July 1, 1932, but this transport has not as yet developed to any great extent.

Joyrides and Special Flights

Nearly 8,000 passengers were carried on joyrides, which is more than twice as much compared with 1931; the majority of joyriders were natives. These flights were made not only in the regular ports of call, but also in several other places in Java, Sumatra and in the Lesser Sounda Islands.

The usual sightseeing trips to Bromo, Tangkoeban Prahoe, Sibajak and Slamat were made, and a few taxi flights. A great interest was shown in advertising flights. More than 50 flights were made, on which a few millions of pamphlets were distributed over the whole Netherlands India. An important flight was the advertising flight from Medan to North Sumatra, Kota Radja and Sabang. A reconnaissance flight was also made to the Lesser Sounda Islands as far as Timor Koepang.

K.L.M. Service Batavia-Amsterdam

As head agency for the K.L.M. and as terminal station of the airline Amsterdam-Batavia, the K.N.I.L.M. saw

their activities considerably increase. The Amsterdam-Batavia line was operated with a remarkable punctuality. In very bad monsoon weather near Kohlak (Siam) one aeroplane was damaged, but a relief plane sent from Batavia took over the mail and delivered it in Amsterdam to schedule. The amount of air mail carried remained quite satisfactory. From Netherlands India ± 225 kg. weekly was despatched. The mail sent by the Straits and Federated Malay States via Alor Star increased considerably.

Owing to the increasing demand for passenger traffic from all countries on the route, and in order to shorten the voyage during the second half of 1932, only the newest F. XII planes and the F. XVIII planes were used.

Large Reduction in Air Insurance

IMPERIAL AIRWAYS, LTD., announce that arrangements have been made with a group of underwriters at Lloyd's and the British Aviation Insurance Co., Ltd., under which a passenger by Imperial Airways machines can insure for £1,000 a day at a premium of one shilling. Hitherto the premium costs were as high as 12s. a day for the same amount. Thus a passenger flying to India can now be insured each day for £1,000 for a premium of 7s., and for £2,000 for 14s. A £2,000 insurance by surface transport would actually cost 16s. This is an improvement of the first importance. It is the greatest possible testimony to the fine record for safe flying which Imperial Airways have earned. Insurance underwriters are the most critical judges of safety and danger, and when they place their risks so low, the ordinary passenger can well throw off his last lingering qualms. The innovation will also be a very welcome relief to the traveller's pocket, for the previous high rates of insurance have been a continual source of annoyance, as well as a sort of danger signal. Under the old rates a £2,000 policy for a flight to India cost £7 4s., which was no light addition to the expenses of the air journey. The reduction of this charge to 14s. should do a very great deal to add to the popularity of air travel.

Deutsche Luft Hansa, 1932

THE report of the Deutsche Luft Hansa shows air travel to be increasing in Germany in spite of a depression, which is directly affecting a quarter of the population through unemployment. Luft Hansa machines conveyed 86,578 passengers during 1932, as against 82,998 of the previous year and 76,894 in 1930, although air mileage was somewhat smaller than in 1931. The mileage covered by Luft Hansa aeroplanes on schedule service was 7,728,309 kilometres (4,800,000 miles), comparing with 8,677,721 km. (5,930,000 miles) in 1931 and 9,062,672 km. (5,640,000 miles) in 1930. The weight of cargo conveyed was only 6 per cent. less than the previous year and savings in its transport could be effected by the employment of the large Junkers machines, for instance, on the Berlin-London route, which were found large enough not only to convey the passengers, but also the full cargo load available, so that the use of extra machines could be dispensed with. On the long-distance routes subsidised by the National Government services were more frequent, and the distance covered by the machines was 4,814,076 km. (3,000,000 miles), as compared with 4,563,177 km. (2,830,000 miles) in 1931. It was, in fact, the same as in 1930. But services on the routes subsidised by the States and the municipalities, primarily hop lines, have suffered considerable reduction, the number of kilometres having come down from 3,009,713 (1,820,000 miles) in 1930, via 2,812,706 (1,750,000 miles) in 1931 to 2,189,642 (1,360,000 miles) in 1932. The utilisation of the available capacity of the aeroplanes operating in regular line services has constantly increased during the last few years. In 1930 it was 33.9 per cent., 1931 38 per cent., and last year 42.5 per cent. This is the more noteworthy as simultaneously also the average size of the machines employed has increased. The available pay load per kilometre flown was 1,397 lb. in 1932, 1,328 lb. in 1931, and 1,300 lb. in 1930. The systematical schooling of pilots, the perfection of instruments and the progress in the development of wireless and radio beam has led to a further increase in the punctuality and the regularity of the air services. Figures in percentages are as follows:—Annual average: 1930, 90.0; 1931, 93.0; 1932, 96.7. January/April and November/December: 1930, 78.6; 1931, 82.9; 1932, 89.8. May/October: 1930, 93.4; 1931, 96.4; 1932, 98.7. As is shown by these figures, regularity has increased particularly during the most unfavourable flying months.

A Rangoon—Hanoi Service?

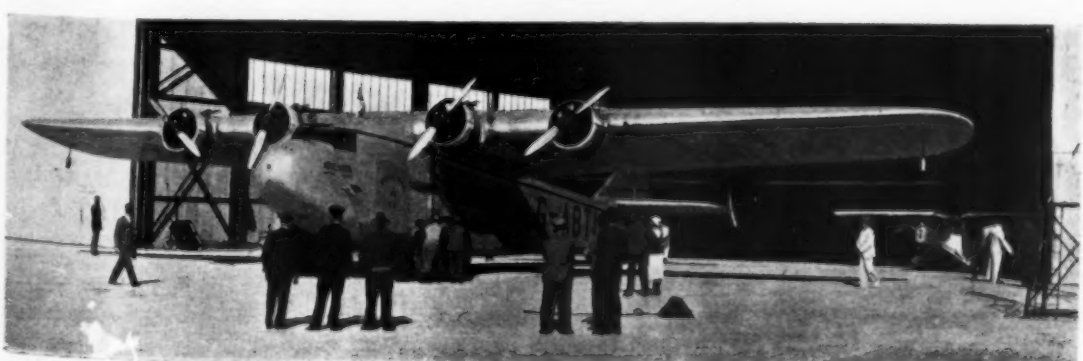
IT is reported that an air service is soon to be established from Rangoon to Hanoi. A chain of emergency landing fields is being arranged for the use of machines on the international routes touching Siam. Air Orient already run a service to Saigon from Europe.

Galway—Dublin Air Service

AFTER completing a 2,000-mile tour of the Continent in the "Monospar" which has been acquired by the Western (Irish) Air Transport Co., Ltd., Mr. O. E. Armstrong, chief pilot of the company, is to commence the operation of a regular week-end flying service between Galway and Dublin on March 24. It is understood that the company will also operate on charter work and joy-riding in western Irish towns during the coming summer. Another Irish organisation, Iona National Airways, have also announced that they propose to operate a daily service to Galway during the summer. The opinion in aviation circles in Ireland is, however, that there will not be sufficient business to warrant a daily service between Dublin and Galway and that two companies in opposition on this route would be most uneconomical.

Northrop "Deltas" for Air Lines

TRANSCONTINENTAL and Western Airways have placed an order with the Northrop company for fifteen high-speed monoplanes, to be known as the "Delta" class. These machines will be generally similar to Frank Hawks' "Sky Chief" (see FLIGHT, January 19, 1933), but will have a passenger cabin, with windows, etc. The pilot's cockpit, placed far aft in Hawks' machine, will be moved forward to a place ahead of and above the cabin, where the view should be very much better. The new machines will be fitted with Wright supercharged "Cyclone" engines, giving 600 h.p. at 8,000 ft.



"ATALANTA" IN AFRICA: Imperial Airways' Armstrong-Whitworth four-engined monoplane *Atalanta*, G-ABTI (originally *Arethusa*), shortly after arriving at Cape Town recently. Note, at the back of the hangar, the Fairey long-range monoplane.

From the Clubs

HANWORTH (N.F.S.)

The total flying time for the past week amounted to 74 hr. 30 min., which included a great deal of cross-country flying, Sqd. Ldr. Helmore to Ford, Mr. Llewellyn to Bristol for "B" licence tests, Mr. Chen to Hamble and Lympne, also for "B" licence tests, and Lady Nelson to Hatfield and return. New members include Mr. Birken, who has started instruction for an "A" licence, and Mr. Back has successfully accomplished his first solo flight.

On Friday, March 10, a very interesting demonstration was given at Hanworth of the Porcella Fireproofing Paint. This paint appears to possess remarkable qualities in that any material treated with one coat is incapable of being burnt. It offers great possibilities in connection with aircraft, and on Friday, March 17, a further demonstration will be given at the Hanworth workshops.

The Lowe-Wylde B.A.C. "Drone," an improved version of the B.A.C. VII Sailplane, is undergoing flight tests at Hanworth. The new model is a considerable improvement on the old one, both in performance and manœuvrability. Experiments are being made with different types of fairings to reduce the high note, apparently caused by the air flow from the propeller tips.

The following were elected on Saturday as the new Committee of the Hanworth Club:—Chairman, Mr. Claude Graham White; Vice-Chairman, Viscount Rattendone; Hon. Secretary, Mr. J. A. Borley; Honorary Members: Hon. Victor Bruce; Noel Whiteside, M.P.; Laurence Wingfield; Maj. Andreae; Flt. Lt. R. E. H. Allen; Mr. C. H. Lowe Wylde.

The President, Lord Stonehaven, was re-elected, and also the Vice-Presidents, Dowager Lady Swathling and Mr. Griffiths Brewer.

BROOKLANDS

Instruction has been proceeding rapidly during the week and several new pupils have joined the Club, including Messrs. Freeman and Vivian and Miss Stapleton-Smith. Many old pupils have returned lately after being absent during the winter months; among these should be mentioned Miss Oldacres. Another member who has just returned to the aerodrome is Mr. R. O. Shuttleworth, the racing motorist, who has been to India in a "Gipsy III Comper Swift" for the Viceroy's Cup. Col. Strange has been flying his "Spartan" and Mr. and Mrs. W. E. Davis paid a visit in one of the Lympne machines. Capt. Ledlie, of Brooklands Airways, Ltd., has just returned after flying the company's Junker monoplane to Dessau for its C. of A.

Two handsome trophies have just made their appearance in the Aero Club. One, the "Ted Jones" Memorial Trophy, in memory of the late Capt. Ted Jones, who was once Chief Instructor of the Brooklands School of Flying; the other, presented by Mr. Hart, will be open to competition among "A" licence pilots once a quarter. Rules for these two competitions will be announced later. The College of Engineering has now raised a Rugby football team and a portion of their aerodrome has been prepared for their use; work has also been started on "The Chapel," which is to be equipped as a gymnasium.

CINQUE PORTS FLYING CLUB

During the week the Club has been extremely busy, and Mr. K. K. Brown, the Chief Instructor, has had little time to himself. The engineering staff have also been busy with C. of A. jobs, engine repairs and overhauls, etc. Mr. Victor Smith's Comper "Swift" was handed over to be prepared for his third attempt at the Cape Record, and the engineering staff are particularly proud of the work they have done on this machine. Among those who witnessed Mr. Smith's departure were a large contingent from the Small Arms School at Hythe, who are taking a very keen interest in flying.

PROGRESS AT GATWICK

Few aerodromes can be more pleasant than Gatwick on spring days like those we have had during our visit there last week-end. We found several "Redwing" aircraft both in the air and ready for instruction, and we ourselves had the pleasure of trying one of these machines. We have always heard that the control achieved by Mr. Kenworthy was very good indeed at the bottom end of the flying range of this machine and certainly we found it so. As a club machine this is, of course, very important, and perhaps made doubly useful by the fact that the bottom end of the range is so low that the "Redwing" touches down "right off the clock," while the take-off, once one knows the machine, can be made very spectacular indeed. The Redwing factory is still operating at Colchester, and we hope before long to be able to give details of a new, somewhat modernised, version which Mr. Kenworthy has designed. We have often drawn attention to the wonderful old timbered clubhouse at Gatwick, and we imagine that the Surrey Aero Club will shortly receive many more visitors, as plans are now under way for Imperial Airways to use this aerodrome as an emergency landing ground instead of that at Marden farther down in Kent, while there are rumours of a really high-speed service being run from there to the Continent before very long by certain very well known private owners.

NORTHAMPTONSHIRE AERO CLUB

On Sunday, March 5, members had an opportunity of inspecting the de Havilland "Dragon Moth" which arrived, piloted by Capt. Broad, who was accompanied by Mr. Thom. Later in the afternoon Lt. Col. Shelmerdine also arrived from Ratcliffe in a "Puss Moth" to inspect

ACTIVITY IN THE SOUTH: A typical gathering of machines which may be seen any week-end at Shoreham, the aerodrome of the Southern Aero Club. In the background is a special "Spartan" three-seater belonging to Mr. Westhead. The cabin arrangement which has been built over the rear cockpit to cover the two passengers makes the machine look very comfortable, while the plated struts which are used throughout give the machine an exceptionally well-finished look. (FLIGHT *Photo.*)

the aerodrome. Another welcome visitor was Lord Willoughby de Broke, the President of the Club, who came over from his private aerodrome at Kineton. Mr. Hamilton, the Secretary, has been setting a good example by putting in a fair number of hours. Mr. Thompson has just purchased a Parnell "Pixie," powered by a 35-h.p. Bristol "Cherub."

GRAVESEND AVIATION, LTD.

Gravesend School of Flying was hampered during the week ending March 4 by bad weather, although a certain amount of instruction was possible during the week, and the fine weather on Saturday and Sunday produced a burst of activity. During the week three new pupils joined the School and commenced instruction, one of these joined after insisting on a trial lesson under appalling weather conditions—a tribute to his keenness. The visitors during the week were Mr. Lipton from Stag Lane and Mr. Austin from Bekesbourne, both in "Moths," Mr. Burnside from Hanworth in the "Segrave Meteor," and Mr. E. W. Percival in the Percival "Gull." This latter machine has an amazing performance and an obviously very large speed range. This is the first opportunity the Gravesend staff have had of inspecting the new "Napier" engine, and are struck by the similar note to the old "Lion" engine and familiar "crackle" when the engine is throttled down. On the Monday the "Desoutter," of Gravesend Aviation, Ltd., left early for Le Bourget on a taxi trip.

The last week has been a record one for the School since its inauguration. Two new pupils joined, and Mr. Dobree, who joined last week, is making great strides, and should go solo shortly. One taxi trip was done to Paris outward bound on Monday, and homeward on Wednesday. Visitors arriving by air were Mrs. Duff from Bekesbourne in a "Moth," Mr. Hanstock in a "Puss Moth" and Mr. Percival in a "Gull." It has now been decided for Sir Alan Cobham's Circus to visit Gravesend on Easter Sunday.

BRISTOL AIRPORT

The Bristol and Wessex Aeroplane Club put in 85 hours flying during the month of February, despite snow, hail, frosts, high winds and other meteorological visitations. This compares very favourably with the 57 hours for the same month of 1932. During the month the following pupils qualified for "A" licences: Messrs. A. G. L. Langfield, A. W. Webb and A. G. Parnell; the latter is the son of Mr. George Parnell, the well known aircraft manufacturer. Mr. F. W. Griffith has come all the way from Dublin to Bristol to complete training for a "B" licence. On February 22 Mr. Leslie Arnott left for Rotterdam in his "Gipsy II Moth"; he was joined by Mr. Stephen Cliff, who was flying a "Desoutter." It is believed that Mr. Cliff is bent on commercial transactions.

Messrs. Norman Edgar & Co., the sales and aircraft operators at the Bristol Airport, have practically completed arrangements for their summer programme, which will probably include an extension of their regular service between Bristol and Cardiff, and further developments in certain Somerset seaside resorts. It is also understood that Messrs. Norman Edgar & Co. have recently completed negotiations for the sale of two Percival "Gulls."

The Club's Annual Ball will be held on March 24 at the Spa Hotel, Clifton, the price of tickets being 6s.

SURREY AERO CLUB

The warm weather over the week-end brought a good many people to the aerodrome, and the Club machines were kept busy on Saturday and Sunday.

The Clay Pigeon Shoot held on Saturday, March 11, was a great success, about 20 shooters enjoying a well organised shoot. In the first event Mr. Crumpler obtained first prize and, in spite of his years, thoroughly enjoyed his short flight. Mr. C. Lucas, captain of the English International Clay Shooting team, complimented the Club on its organisation and happy knack of making people at home.

YORKSHIRE AEROPLANE CLUB (N.F.S.)

During the week commencing February 25 no flying was done, the aerodrome being completely cut off by snow storms and blizzards. During the past week, however, about 12 hr. have been flown. On March 5 Mr. G. H. Ambler flew his "Monospar" to Yeadon, and on March 9 Mr. H. Lapish successfully passed his tests for an "A" licence. On March 8 a dinner was held at the club-house, the speaker being Maj. Bampus, from Brough.

MAIDSTONE AERO CLUB

Maidstone Aero Club are holding a Treasure Hunt on March 19, and on March 26 a Bomb-Dropping Competition. The Sunday evening dances continue and have been, up to the present, exceedingly well supported. On Saturday, April 22, there will be held a gymkhana which will include such equestrian items as jumping musical chairs, apple and bucket racing, etc.; these will take place on a special portion of the aerodrome and will not interfere with flying.

HULL AERO CLUB

The month of March marks the closing of the winter season, and now that the real flying season is beginning, the Club appeals to all members to assist in establishing a record number of hours for the year 1933. Two lectures will be held during the current month, one on Thursday, March 16, by Capt. Basil Barton, M.C., M.P., on "A New-Comer to Parliament," and the second on Thursday, March 30, on "The History of the Blackburn Aeroplane Co.," by Capt. Norman Blackburn; the latter should be particularly interesting and amusing, the subject providing the interest and the lecturer the amusement.

MANCHESTER AERO CLUB

The first social function of the newly formed Manchester Aero Club took place on March 4, in the form of a hot-pot supper at the aerodrome hotel followed by a dance in the new clubroom. In the course of his speech, the Chairman, Mr. W. G. Browning, briefly outlined the activities of the Club and welcomed visitors, many of whom he hoped would join the Club. Mr. Harrison, a private owner of a "Moth," replying on behalf of the visitors, wished the Club "happy landings." After the Secretary had said a few words, the party adjourned to the new clubroom to dance. The clubroom is pleasantly situated and commands a fine view of the aerodrome and tarmac. Further information about the Club can be gained from the Hon. Secretary, Mr. H. McCann, A.C.A., 5, John Dalton Street, Manchester.

IRISH AERO CLUB

Flying was only possible on 13 days during last month by reason of very severe weather conditions. Even on good days, however, few members turned up at Baldonnel, and the total number of hours flown was very low. Two competitions, one a landing contest for the Captain Saul Cup and the other a map-reading event, will take place on March 17 and 18. The annual general meeting of the Club will be held in the Dolphin Hotel on March 29.

THE MERSEY MODEL AIRCRAFT CLUB

The above-named Club was formed in August, 1932, for the purpose of encouraging model aeronautics in the Manchester and Liverpool areas. The Club staged a very attractive display of models at the "Hobbies and Models Exhibition" which was held at the City Hall, Manchester, in January last. The models ranged from flying scale models of 18 in. span to the standard type of general purpose and duration models of 48 in. span.

Preparations have now been made for the two sections to commence outdoor activities. In the Manchester area flying will take place during week-ends on the old aerodrome, Princess Road, Alexandra Park. The Liverpool section has, by the kindness of the Liverpool Corporation, been granted permission to use the Liverpool Airport, Speke, on Saturdays and holidays.

The membership in each district is to be limited to 24, and interested aeromodellists are therefore requested to make early application to the Hon. Secretary for complete particulars. Hon. Secretary: F. J. Sheldrake, 158, Birchfield Road, Widnes.

Henlys' Rally

LAST year Henlys, Ltd., of Heston Airport, Middlesex, organised, through their aviation department, a combined motoring and flying rally at Heston. This year a similar event is being got up, and will take place on June 10.

The Land Speed Record

IT may be of interest to note that the Rolls-Royce engine in Sir Malcolm Campbell's *Bluebird* motor car, on which he obtained the world's land speed record of 272.108 m.p.h., was fitted with K.L.G. Plugs.

THE AIR ESTIMATES

THE Air Estimates for the year 1933* were issued on March 8, and show a net increase of £26,000 as compared with last year's estimates. The gross estimate is £19,638,600, but appropriations-in-aid are expected to amount to £2,212,600, thus reducing the total for effective and non-effective services to £17,426,000.

The following table† shows the net amounts required under the various votes, and we have added the figures for the last five years.

Vote		NET ESTIMATES					
		1933	1932	1931	1930	1929	1928
		£	£	£	£	£	£
1	Pay, etc., of the Air Force	4,110,000	3,930,000	3,907,000	3,731,000	3,323,000	3,401,000
2	Quartering, stores (except technical supplies and transport)	1,487,000	1,590,000	1,721,000	1,735,000	1,676,000	1,711,000
3	Technical and warlike stores (including experimental and research services)	7,203,000	7,350,000	7,672,000	7,596,000	6,585,000	6,567,000
4	Works, buildings and lands	1,610,000	1,650,000	1,790,000	1,720,000	1,700,000	1,700,000
5	Medical services	285,000	295,000	302,000	298,000	306,000	310,000
6	Technical Training and Educational services	384,000	423,000	484,000	493,000	498,000	504,000
7	Auxiliary and Reserve Forces	464,000	516,000	593,000	59[illegible],000	556,000	554,000
8	Civil Aviation	490,000	473,000	470,000	500,000	450,000	415,000
9	Meteorological and miscellaneous effective services	358,000	242,000	245,000	245,000	228,000	223,000
10	Air Ministry	645,000	645,000	656,000	675,000	661,000	657,000
	Total effective services	17,036,000	17,114,000	17,846,000	17,584,000	15,983,000	16,042,000
11	Non-effective services (half-pay, pensions and other non-effective services)	390,000	286,000	254,000	266,000	217,000	208,000
	Total effective and non-effective services	17,426,000	17,400,000	18,100,000	17,850,000	16,200,000	16,250,000

Personnel

The numbers of personnel to be borne on the establishment of the R.A.F., or attached thereto, exclusive of India, but including Aden:—*Air Officers:* Total, 38 (same as last year). *Other Commissioned Officers:* 3,150 (a decrease of 50). *Cadets:* 130 (a decrease of 10). *Warrant Officers:* 520 (an increase of 8). *Non-Commissioned Officers:* 6,000 (an increase of 100). *Aircraftmen:* 19,042 (a decrease of 398). *Apprentices:* 2,120 (a decrease of 650). Number to be voted: 31,000 (including Army personnel attached to the R.A.F.) (a decrease of 1,000).

Financial Expenditure

Vote 1.—Estimate of the sum required for pay, etc., of the R.A.F.:—Pay and personal allowances of officers, £1,230,000; Pay and personal allowances of airmen, £2,216,000; marriage allowance, £132,000; National Health, etc., and unemployment insurance—employer's contributions in respect of airmen, £51,000; Miscellaneous allowances and payments, £23,000; Civilians, £891,000; Service gratuities to airmen on discharge, etc., £15,500; Recruiting staff and expenses, £5,500. Gross total, £4,564,000. Appropriations-in-aid, £454,000; Net total, £4,110,000; Net increase, £180,000.

Vote 2.—Accommodation allowances, £184,000; Barrack services, £58,000; Fuel and light, £236,000; General stores, £121,000; Clothing, £200,000; Provisions and animals, £457,000; Transportation, £325,000. Gross total, £1,581,000. Appropriations-in-aid, £94,000. Net total, £1,487,000. Net decrease, £103,000.

Vote 3.—Technical and warlike stores provide for the following amounts:—Aeroplanes, seaplanes, engines and spares, £5,736,000; Experimental and research establishments, £135,000; Inspection services, £181,000; Instruments, photographic and miscellaneous stores, £162,000; Armament and ammunition, £447,000; Electrical stores, £247,000; Miscellaneous research and development, £230,000; Miscellaneous materials, £138,000; Balloons and hangars, £7,000; Mechanical and other transport, £214,000; Petrol and oil, £935,000; Rewards to inventors and miscellaneous claims, £1,000; Airship development, £16,000. Gross total, £8,449,000. Appropriations-in-aid, £1,246,000. Net total, £7,203,000. Net decrease, £147,000.

Vote 4.—Works, buildings and lands shows the following figures:—Staff for works services, £215,500; New works, additions and alterations, amounting to £2,500 each and upwards, £840,000; New works, additions and alterations under £2,500 each, £97,000; Ordinary repairs, renewals and maintenance, £455,000; Grants towards the cost of works, £5,000; Purchases of lands and buildings, £60,000; Rents, compensations and reinstatements, £32,000; Incidental expenses of Air Ministry estates, £9,000; Provision of telephone and telegraph services, nil; Miscellaneous works services, £8,500; Stores and plant for works, £20,000; Machine tools, £20,000. Gross total, £1,762,000. Appropriations-in-aid, £152,000. Net total, £1,610,000. Net decrease, £40,000.

Vote 5.—Medical Services.—Pay and personal allowances of officers, £132,000; Pay and personal allowances of airmen, £77,000; Nursing service, £21,000; Fees to civilian medical practitioners, £10,000; Civilians employed in hospitals and sick quarters, £17,500; Medical stores and supplies, £15,000; Payments to hospitals, £26,000; Miscellaneous charges, £1,500. Gross total, £300,000. Appropriations-in-aid, £15,000. Net total, £285,000. Net decrease, £10,000.

Vote 6.—Technical Training and Educational Services.—Imperial Defence College, pay and allowances and contribution towards general expenditure, £2,800; R.A.F. Staff College, Andover, salaries, wages and contingencies, £13,700; R.A.F. College, Electrical and Wireless School, Cranwell, salaries, wages and contingencies, £127,000; School of Technical Training (Apprentices), Halton, salaries, wages and contingencies, £165,000; School of Technical Training (Men), Manston, salaries, wages and contingencies, £22,000; School of Physical Training, Uxbridge, salaries and wages, £2,900; School of Store Accounting and Storekeeping, Kidbrooke, salaries and wages, nil; General educational services, £52,600; Miscellaneous educational charges, £8,000. Gross total, £394,000. Appropriations-in-aid, £10,000. Net total, £384,000. Net decrease, £39,000.

Vote 7.—Auxiliary and Reserve Forces.—R.A.F. Reserve: (*a*) Pay and personal allowances of permanent staff, £3,100; (*b*) pay and personal allowances during training, £18,700; (*c*) retaining fees and reserve pay, £127,000; (*d*) payments to civil companies for training courses, £130,000; (*e*) miscellaneous expenses, £2,000. Special Reserve and Auxiliary Air Force: (*f*) Pay and personal allowances of H.Q. staff, £11,900. Special Reserve: (*g*) Pay and personal allowances of regular personnel, £77,000; (*h*) training, £4,400; (*j*) miscellaneous expenses, £1,300. Auxiliary Air Force: (*k*) Pay and personal allowances of regular staff, £57,000; (*l*) grants to county associations, £14,500; (*m*) training, £9,000; (*n*) miscellaneous expenses, £3,000. Auxiliary Air Force Reserve: (*o*) Training, £100. University Air Squadrons: (*p*) Pay and personal allowances of instructors, etc., £4,000; (*q*) miscellaneous expenses, £900. Voluntary Aid Detachments, £200. Gross total, £464,100. Appropriations-in-aid, £100. Net total, £464,000. Net decrease, £52,000.

Vote 8.—Civil Aviation.—Civil aviation aerodromes, £34,000; Air routes, surveys, etc., £22,000; Technical equipment, £12,000; Works, buildings and lands, £24,000; Miscellaneous, £3,000; Civil aviation subsidies and grants, £568,000. Gross total, £663,000. Appropriations-in-aid, £173,000. Net total, £490,000. Net increase, £17,000.

Vote 9.—Meteorological and Miscellaneous Effective Services.—Meteorological services, £50,000; Salaries, wages and allowances of staff at meteorological stations, £63,500; Fuel, light and transport, £4,700; Instruments, equipment, stores and research, £10,000; Grant in aid of Polar research, £4,000; Works services, £4,000; Telegraph, telephone and miscellaneous charges, £17,500; Superannuation, £1,300. Miscellaneous effective services: Compensation for losses, etc., £10,000; Losses by exchange, etc., £400; Aerodrome guards furnished from the Iraq Army, £118,000; Telegraph and telephone charges, postage abroad, £64,600; Miscellaneous, £25,000; Terminal charges, in connection with Indian troops lately employed in Iraq, payable to the Government of India, £5,000;

* Printed and published by H.M. Stationery Office. Price 3s. 6d. net.

† This table gives Estimates not corrected by Supplementary Estimates or under-spending.

Allowances to ministers of religion, £8,000. Gross total £386,000. Appropriations-in-aid, £28,000. Net total £358,000. Net increase, £116,000.

Vote 10.—Air Ministry.—Salaries and allowances of the Air Council and Department of the Secretary, £298,800 ; Salaries and allowances of the Department of the Chief of the Air Staff, £111,000 ; Salaries and allowances of the Department of the Air Member for Personnel, £45,700 ; Salaries and allowances of the Department of the Air Member for Supply and Research, £149,000 ; Salaries and allowances of the Directorate of Civil Aviation and the Accidents Branch, £21,500 ; Pay of messengers, cleaners, etc., £22,100 ; Contingent expenses, £900. Gross total, £649,000. Appropriations-in-aid, £4,000. Net total, £645,000. Same as last year.

Vote 11.—Half-pay, Pensions and Other Non-Effective Services.—Rewards to officers and airmen, £350 ; Half-pay of officers, £7,000 ; Service and disability retired pay and gratuities of officers and nurses, £230,000 ; Wound pensions—officers, £530 ; Service and disability pensions and gratuities—airmen, £91,200 ; Pensions, gratuities and allowances to widows, children, etc., of deceased officers and airmen, £27,000 ; Civil non-effective payments—recurrent charges, £11,570 ; Civil non-effective payments—gratuities and other non-recurrent charges, £15,250 ; Injury grants, £8,400 ; Commutation of retired pay, wound pensions, etc., £26,700 ; Relief fund, £500 ; Miscellaneous non-effective payments, £8,000. Gross total, £426,500. Appropriations-in-aid, £36,500. Net total, £390,000. Net increase, £104,000.

MEMORANDUM BY THE SECRETARY OF STATE FOR AIR TO ACCOMPANY AIR ESTIMATES FOR 1933

THE net total of Air Estimates for 1933 stands at £17,426,000, and the gross at £19,638,600. This net total is not, however, comparable with the current year's figure of £17,400,000 ; and the apparent increase of £26,000 actually conceals a reduction of nearly £340,000, since expenditure in excess of £360,000 hitherto borne on the Vote for Colonial and Middle Eastern Services has this year been transferred to Air Votes. This transfer would normally have been reflected in a heavy decline in Appropriations-in-aid, but there will in 1933 be increases in receipts under other heads—more particularly in the amounts payable in respect of the Fleet Air Arm and the squadrons in India—as a result of which the actual decrease in Appropriations-in-aid is only £90,000.

This further substantial reduction in air expenditure can only be justified in the light of the continuing need for exceptional measures of economy, and the postponement of a number of important services has again been unavoidable.

Some relief has been afforded by the fact that in the current financial year £50,000 had to be provided for an extra pay day, which is not required in 1933 ; and full allowance has, of course, been made for the prevailing low prices of commodities. For the rest the reduction has been rendered possible only as a result, firstly, of a continuous and stringent review of all services throughout the year, which has enabled a number of minor savings to be made, the cumulative effect of which is considerable ; and, secondly, of certain major changes of policy, in particular a decision to close down for the time being one of the four Flying Training Schools.

As in 1932, every precaution has been taken to ensure that the economies effected shall not react adversely on safety or unduly impair efficiency. In consequence there is a reduction of only £2,000 in the provision under Vote 3 for the purchase of aeroplanes, seaplanes, engines and spares, and the bulk of the savings have been secured under Votes 2 (Non-technical stores, Quartering, Supplies and Transport) and 4 (Works and Buildings).

Fuller explanations of the main increases or decreases in the several Votes will be found below under the appropriate headings.

The following table compares in outline Estimates for 1933 with those for the current year:—

	1933	1932	+ or −
	£	£	£
Gross Estimate	19,638,600	19,702,700	− 64,100
Deduct Fleet Air Arm grant ..	1,089,000	1,025,000	+ 64,000
Deduct other Appropriations-in-aid	1,123,600	1,277,700	− 154,100
Net Estimate	17,426,000	17,400,000	+ 26,000

Disarmament

The policy of His Majesty's Government in relation to Air Disarmament has been fully stated in Command Paper No. 4189 issued last November. No comment is required on the wider aspects of that policy. The practical and immediate proposals put forward for a general reduction in the size of the leading air forces to the British level and thereafter for an all-round further reduction by one-third and for a limitation in the size of military aircraft would, if accepted, produce substantial economies in expenditure on air armaments, and, more important still, would avert the danger of their competitive development. The modest Home Defence programme of 1923 is held in suspense for another year, a decision which is a further earnest of the wholehearted desire of His Majesty's Government to promote Disarmament and to bring about a reduction in the world's air forces on an equitable basis. In the meantime the Royal Air Force remains at a figure of strength substantially less than that of other great nations, despite the rapidly growing importance of air power to the British Empire with its far-flung responsibilities.

Strength, Distribution and Organisation of the Royal Air Force

The strength of the Royal Air Force remains accordingly at last year's figure of 75½ regular squadrons, including the equivalent of 13½ squadrons in the Fleet Air Arm.

The Home Defence Force still embodies only 42 of the 52 squadrons of the original programme ; and of these 42, 13 are non-regular.

There has been no change in the distribution of squadrons as between Home and Overseas.

Operational Activities

Operations had to be undertaken in the Barzan area of Kurdistan in the spring of 1932. After the Iraqi forces employed had encountered heavy opposition, air units were employed in co-operation and the campaign was brought to a successful issue.

Another notable event of the past year was the transport by air of a battalion of Infantry (1st Northamptonshire Regiment) from Egypt to Baghdad. This movement was required as a measure of precaution in view of unrest which had temporarily developed among the Assyrian Levies in Iraq. The battalion was not intended to undertake active operations, but merely to exercise a stabilising influence, and provide other ground troops to replace the Levies, if necessary. In all 562 officers and men were transported by air over a distance of approximately 800 miles within a period of six days. The move was carried out in twenty-five troop-carrying aircraft of Nos. 70 and 216 Squadrons. After a short stay the battalion, its work successfully accomplished, returned by air to Egypt in easy stages. The episode represents a striking demonstration of the mobility conferred by the use of aircraft as well as of close and effective co-operation between the Army and the Royal Air Force.

In September the column which was carrying out the relief of the troops stationed in Chitral was attacked. As attempts were being made to induce the surrounding tribes to rise, the Government of India authorised air action against the hostile sections, which was immediately successful and averted a dangerous situation.

In British Somaliland aircraft from No. 8 Squadron at Aden have been co-operating successfully with the British and Abyssinian Frontier Commission for the demarcation of the British Somaliland and Abyssinian frontiers. Air photography has done much to save the Commission's time and labour.

Minor activities of some local importance took place in the Ath Thamer and Dubeini areas of the Aden Protectorate, in both cases for the suppression of attacks upon trading caravans. Further, some extensive anti-smuggling reconnaissances were successfully carried out on the Western Coast of the Red Sea by aircraft of No. 47 Squadron, which were fitted with floats for the purpose.

In Trans-Jordan aircraft and armoured cars co-operated effectively with ground forces in precautionary movements necessitated by the activities of Ibn Rifada, a sheikh in revolt against King Ibn Saud. Their object was to prevent the rebels from receiving reinforcements or other help through territory under British control. The measures taken were entirely successful and Ibn Rifada was finally defeated by the Government forces.

In this case, as in the great majority of precautionary movements which are part of the normal routine of the

squadrons overseas, the objects in view were achieved without any active operations being necessary; in short, air power is able for the most part to work by the prevention, rather than by the repression, of outbreaks.

Air Routes and Long-Distance Flights

Much attention continues to be given to the development of mobility by means of long-distance flights over routes of potential importance in relation to civil, no less than strategic, communications. In advance of the establishment of a civil air service to Australia, the route is being opened up by service aircraft based on Singapore, just as in past years the Royal Air Force undertook the preliminary work on the routes from Cairo to Baghdad and the Cape. In the course of 1932, three flying boats from No. 205 Squadron flew from Singapore to Port Darwin and back, covering a distance of 4,143 miles. No serious operational or maintenance difficulties were experienced throughout the period of 23 days during which the boats remained at moorings or on the water. During the stay at Port Darwin training exercises were carried out in co-operation with aircraft of the Royal Australian Air Force. In the opposite direction from Singapore, four aircraft of No. 36 Squadron have lately flown from Singapore —via Calcutta and Delhi—to Peshawar and back—a total distance of some 7,100 miles; and aircraft of No. 28 Squadron, a unit on the Indian establishment, have flown to Singapore and back from Ambala—a distance of about 6,200 miles. The flight by service aircraft from Cairo to the Cape and back, which has been customary for several years past, was not carried out in 1932. The pioneer work of the Royal Air Force having been realised in the establishment of a regular civil air service, it was decided that for the present the squadrons of the Middle East Command might with advantage seek new fields for exploration, though it is anticipated that flights to South Africa will on occasion again be undertaken in co-operation with the Union Defence Forces. Flights were accordingly organised between Cairo, Somaliland and Aden by three aircraft of No. 216 Squadron, and between Palestine and East Africa by four aircraft of No. 14 Squadron. In the course of the latter flight, visits were made to Kenya, Tanganyika, Zanzibar and Uganda. In completing an itinerary of 18,000 miles the aircraft failed on only one occasion to arrive at their various destinations exactly to their scheduled time. Facilities were afforded for civil officials to visit outlying districts by air, and in Kenya the aircraft were able to assist the Government by carrying out survey work, the results of which will for the present avoid a considerable expenditure on ground survey.

The long-distance flight which had been planned for some time past with a specially prepared aircraft has now been duly carried out, and valuable experience has been acquired as to the possibilities of reinforcing the most distant parts of the Empire by air. The flight, from Cranwell to Walvis Bay in South Africa, established a world record of 5,340 miles, and was accomplished with complete success despite the prevalence of difficult weather conditions over considerable sections of the route. It reflects great credit on all concerned—on the pilots, on the technical personnel responsible for maintenance, and on the designers and constructors both of aircraft and engine. Acknowledgments are also due for the generous and willing assistance afforded by foreign and colonial governments over whose territory the aircraft passed in the course of the flight.

The Royal Air Force has thus won for Great Britain in the space of eighteen months the world's records both for speed and distance; whilst private enterprise has achieved for this country the world's record for height. There could be no more striking proof of the pre-eminent qualities of the products of the British aircraft and engine manufacturing industries.

Personnel and Training

Vote 1 (Pay, etc., of the Royal Air Force) stands at a net total of £4,110,000, an apparent increase of £180,000 on the current year's figure, which is, however, primarily due to the absorption of £175,000 hitherto borne on the Vote for Colonial and Middle Eastern Services.

Further important developments of personnel policy have taken place in the current year which require special mention. In particular, a comprehensive review is proceeding of the requirements of the Service in airmen of the various trades, with special reference to prospects of promotion and re-engagement. A new scheme has already been formulated for the largest class of skilled men, viz., fitters and riggers, who are responsible for the key duties of aircraft and engine maintenance.

Having regard to technical advances in the last ten years, notably the introduction of metal construction and the greater reliability of engines, it is no longer considered necessary to allot two skilled men, a fitter and a rigger, to each aircraft. At the same time it is, of course, essential to maintain the principle of individual responsibility for safety. It has accordingly been decided to work gradually to a basis of allowing for each aircraft one highly skilled and one unskilled man. The former category will be trained at Halton for three years up to a standard to perform all the fitting and rigging work involved in the maintenance of aircraft in flights, and will be responsible, under the supervision of the flight officers and non-commissioned officers, for the safety of the aircraft individually allotted to them. After some years in these duties, these skilled men will return to Halton for a year's advanced course to qualify them to perform fitting and rigging work in workshops and to become non-commissioned officers in flights. The unskilled men will be known as mates and will be recruited from aircrafthands.

This policy will allow of a large reduction in the number of apprentices entered yearly for training at Halton and will at the same time greatly improve the prospects of promotion and re-engagement open to skilled personnel. A further improvement will be secured by the gradual upgrading of the rank of a number of the skilled posts in workshops. The aim has been to ensure that as far as possible promotion is available to such men as are suitable for greater responsibility so soon as their accumulated experience renders them qualified to exercise it.

Consideration has also been given to the position of those men who, on completing their initial engagement at age 30, desire to re-engage to complete time for pension. In determining the number to be re-engaged it is an overriding consideration, in the interests alike of the Service and of the individual, that only so many should be accepted as can be given employment in ranks appropriate to their age and experience. To ensure equal consideration of the applications received for re-engagement the vacancies available will be allotted on a basis of strict competition. Those not applying or not selected for re-engagement on the active list will (if otherwise suitable) be given the alternative of re-engaging for four years in the Reserve; if they so re-engage they will be granted a special gratuity of £100. This policy, which will extend generally to all the highly skilled men who enter the Service as aircraft apprentices, will not only meet the essential need of the Service for a reserve of highly skilled fitters, but will also, by means of the substantial gratuity, assist those who cannot be continued on the active list to resettle themselves in civil life.

As already mentioned, it has been decided in the interests of economy, to dispense for the present with one of the four Flying Training Schools. The school at Digby in Lincolnshire will accordingly be closed in the summer. This school has been selected because its continued use would involve considerable expenditure in replacing its buildings, which are temporary structures dating from the war period.

Auxiliary and Reserve Forces

The net total of Vote 7 (Auxiliary and Reserve Forces), at £464,000, shows a reduction of £52,000 on the current year's figure.

This reduction is, in the main, the result of the adoption of a new reserve flying training scheme under which training will be almost entirely performed on approved light types of aircraft, with a consequent substantial saving in cost. The economy arising out of the extended use of light aircraft will enable both the quantity of the actual training to be increased and its quality to be improved. The training will continue to be carried out at civilian flying schools, but will include, in addition to normal flying, practice in aerobatics, blind flying, camera gun work and photography for all pilots, as well as an increased amount of air pilotage, and will thus approximate more closely to the conditions of regular service flying. The training given will, it is hoped, be sufficiently complete to enable pilots to requalify, if necessary, on modern high-performance service types with a minimum of further instruction. Special flying instruction and blind flying courses will be given to a limited number of selected pilots in lieu of annual training. Training on flying-boats will be substituted for the training previously given on float-planes.

The strength of the Cadre (Special Reserve) and Auxiliary Air Force Squadrons has been generally maintained. These units again participated most effectively in Air Exercises. The three squadrons of the Auxiliary Air Force recruited from the London area demonstrated at the Display the high standard of Wing drill they have attained. The number of flying hours showed an increase over the previous year. The standard of aircraft maintenance in these squadrons was very satisfactory.

An Auxiliary Air Force Reserve of officers has been constituted with the object of enabling officers who have completed their engagements, but are prevented from re-engaging for a further period on the active list of the Auxiliary Air Force, to maintain their connection with the Service and keep themselves in flying practice so far as their individual circumstances permit.

Both University Air Squadrons were maintained at their full strength of 75 members. During the year the flights affiliated to these squadrons were re-equipped with more modern types of aircraft, but, in spite of the additional dual instruction required during the conversion period, the amount of solo flying carried out during the year showed a satisfactory further increase. The flight affiliated to the Oxford Squadron moved from Upper Heyford to Abingdon during the Michaelmas term; the latter should prove a more convenient station for training.

Technical Equipment

The net total of Vote 3 (Technical and Warlike Stores) is £7,203,000, a reduction of £147,000 on the corresponding figure for 1932.

Whilst the provision of new types is still strictly governed by financial limitations, these Estimates allow for a further substantial measure of re-equipment.

The number of flying hours between overhauls of airframes continues to increase with a consequential economy in expenditure on reconditioning and the purchase of spares. All-metal aircraft have given excellent results under the most arduous service conditions, including hot climates. Although it is too early to say that corrosion has been completely overcome, it is no longer a serious difficulty with landplanes, and in seaplane construction a great advance has been made as a result of developments in metallurgical knowledge and the protection of exposed surfaces.

The programme of replacement of obsolete and worn-out motor vehicles will be continued in 1933, so far as financial considerations permit, and the benefits of this policy are now beginning to be felt in the decreased consumption of spares which has enabled a substantial reduction to be made under the relevant subhead of the Vote. Marine craft which have outlived their economic usefulness are also being gradually replaced by more modern types.

The provision for petrol again requires a larger allotment, which is due (apart from the incidence of taxation and fluctuations in commercial prices) to the steady rise in the performance required of service aircraft, with a consequent growth in engine horse-power, as well as to the increased number of hours flown.

Research and Technical Development

Provision for experimental services (shown in Appendix I) stands at £1,385,000, a decrease of £73,000 on the figure of 1932. This reduction has only been achieved with difficulty, owing to the variety of novel and complex problems of great importance to the Royal Air Force and aviation in general which call urgently for further research.

The reorganisation and reconstruction of the Royal Aircraft Establishment have been completed, and certain major instruments of research, which have involved considerable capital expenditure, are now about to attain full operation. The Compressed Air Tunnel at the National Physical Laboratory has completed its calibration tests and the important programme of research awaiting it has been commenced. Standard wing sections are now being methodically tested, and results compared with those obtained in flight. This tunnel is capable of attaining an air density of 25 atmospheres and a wind speed of 90 ft. per sec., marking a considerable advance on tunnels of the same type in other countries, and enabling scientific investigation to keep pace with the increased performance demanded of modern aeroplanes.

The Vertical Wind Tunnel, to which reference was made in last year's Memorandum, and which was built at Farnborough for the express purpose of investigating the problems associated with spinning, has proved so valuable that its use has been extended from theoretical research to the practical testing of models of all aircraft ordered by the Air Ministry (except the largest types) before construction of full-size machines.

The Seaplane Testing Tank at Farnborough, with its delicate measuring apparatus, which was also referred to last year, is now in operation. The research work accompanying its construction has shown that there is abundant justification for a tank devoted exclusively to the problems associated with floatplanes and flying boats, which are sometimes wholly water-borne, sometimes wholly air-borne, but also during part of the take-off or alighting runs are borne simultaneously both by air and by water, a condition to which marine engineering supplies no analogy.

The Large Wind Tunnel at Farnborough, of which mention was made last year, is expected to be ready by the spring of 1934. The modernisation of one of the 7-ft. wind tunnels at the National Physical Laboratory is nearly completed.

Effective progress has been made in the suppression of aeroplane noise as the result of a scientific attack on this problem. The noise experienced by passengers in the latest machines operating over Imperial Airways' routes is little more than that in the carriage of an express train, so that conversation can be carried on without difficulty. This material improvement in comfort has greatly added to the popularity of air travel.

The heavy oil or compression ignition engine continues to be the subject of special investigation.

The production of a satisfactory light spirit from British coal has progressed beyond the laboratory stage; an initial test of bulk supplies has given satisfactory results, and several thousand gallons have now been ordered for extended service trials.

Airships

During the past year, the Royal Airship Works and the masts and plant at Karachi and Ismailia have been maintained on a care and maintenance basis; and, in accordance with the policy approved by H.M. Government, they will be similarly maintained in 1933.

The airship sheds at Cardington are being put to temporary use for housing aircraft held in reserve by the Royal Air Force. Certain tests are being carried out with one bay of R.100, which was retained for that purpose; and information, both operational and technical, which remains from the airship constructional programme of 1924-30, or is received as a result of the activities of other countries, is being carefully examined, collated and recorded.

In the spring of 1932 a visit was paid to Friedrichshafen at the invitation of Dr. Eckener, and a senior member of the Airship Staff was subsequently taken on one of the voyages to South America and back accomplished by the *Graf Zeppelin* with such striking regularity. Later in the year an invitation was received by the same officer to take part in the exercises carried out by the United States Naval authorities with the airship *Akron*, and several flights were made in that vessel. In both countries every opportunity was afforded to observe all phases of airship activity, and the thanks of the department are due alike to the Naval authorities in the United States and to Dr. Eckener.

Works

The net total of Vote 4 at £1,610,000 is £40,000 below that for 1932, despite the fact that capital works expenditure in Iraq is no longer repayable from the Vote for Colonial and Middle Eastern Services. The decrease is due partly to the estimates being framed on a basis of a lower level of prices, but mainly to a reduced programme in view of the urgent need for curtailing expenditure.

Provision is made for the commencement of the new station to the west of the Euphrates to which, under the Treaty with Iraq, the Imperial Forces now at Hinaidi and Mosul are due to move in a few years' time. Apart from this item, the new services proposed are, as in 1932, confined to necessary improvements to the accommodation of existing units.

The gross total of Vote 8 is £663,000, of which £146,000 is repayable by the Government of the Union of South Africa and other African Administrations in respect of the Egypt-South Africa air service. The net total is £490,000, which represents an increase of £17,000 on the provision in 1932.

This increase is due to the inclusion of £30,000 for the

projected extension of the existing Indian air service to Australia. It is hoped that, in the absence of unforeseen delays, regular communication by air between this country and Australia will be established by the late summer or early autumn. Plans for a weekly service have been approved in principle and are now under discussion between His Majesty's Governments in the United Kingdom and in Australia and the Government of India.

The provision for subsidy payments to Imperial Airways, Ltd., under the existing agreements in respect of their European, Indian and African air services amounts to £511,000 gross and £365,000 net.

The permission accorded by the Persian Government to the company to operate the air service to India across Persian territory finally expired on September 30, 1932, and since that date the service has followed a route along the Arabian coast of the Persian Gulf. The change has involved certain expenditure on ground organisation and other services, to meet which a total sum of £12,000 will be required in 1933.

In order to increase the safety and efficiency of the cross-Channel Air Services in conditions of bad visibility, it is proposed to improve the ground organisation and lighting of the air route between Croydon and the coast, and to make arrangements for Gatwick Aerodrome to be available as an alternative to Croydon when required. The necessary provision has been made for this purpose.

The scheme for financial assistance to the Light Aeroplane Clubs has been revised and more advantageous terms approved. The revised scheme came into operation as from April 1, 1932, and £20,000 has been included to meet its requirements. Sixteen clubs in all are now receiving subsidy. Private flying continues to show a satisfactory increase despite the difficult economic conditions prevailing. There are now over 400 private aircraft on the British register as compared with only 80 five years ago.

Meteorology

The net estimated cost of Meteorology (Vote 9) is lower by £5,500 than in 1932. A decrease in expenditure of £3,000 is anticipated, and an increase in receipts of £2,500.

Provision to the extent of £4,000 is again made for the special research in Meteorology and Magnetism now being carried out by a party of British meteorologists at Fort Rae in Canada, as a part of the international programme of the Second Polar Year. This is the second instalment of the total of £10,000 which will be devoted to that enterprise. A sum of £2,100, to be recovered from the Royal Society in respect of salaries of the members of the expedition paid during 1932, is shown as an appropriation-in-aid. Expenditure on normal research will again be limited to £1,000.

A fully-staffed meteorological station will be opened at the beginning of the financial year at the civil aerodrome at Manchester; the staff at this station will cost £1,000 a year, but the recent reorganisation of the Forecast Branch at Headquarters and other adjustments have resulted in an annual saving of an equivalent amount.

The provision for expenditure on instruments is unchanged.

Building and renovation work is again being kept to a minimum, and a further reduction of £2,000 has been made under this head.

Air Ministry

Vote 10 (Air Ministry) remains at the same figure as last year.

Owing to the number and variety of problems affecting the maintenance of aircraft and engines which are continually arising, it has been decided to strengthen the department of the Air Member for Supply and Research by the appointment of a Deputy Director of Repair and Maintenance. The improved supervision and control of the engineering and workshop organisation which will result from this appointment should lead in due course to substantial economies in expenditure on the upkeep of technical equipment.

Savings have been secured in other directions which offset the cost, not only of this additional staff, but also of automatic increases under incremental scales. The number of the headquarters staff of the Air Ministry is indeed now 12 per cent. lower than in 1921, despite an immense growth in the work and responsibilities of the department during the intervening period, alike in the spheres of service and civil aviation, which is reflected (to take a single illustration) in an increase of some 50 per cent. in the volume of incoming correspondence.

With the close of the current financial year Marshal of the Royal Air Force Sir John Salmond will, at his own request, relinquish the post of Chief of the Air Staff. I take this opportunity to acknowledge the conspicuous services which he has rendered to the country and to the Royal Air Force, both during and since the war, in a variety of important commands and appointments—and not least during the three years for which he has held his present high office.

LONDONDERRY.

Air Ministry,
March 6, 1933.

Correspondence

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

UTILITY OF LONG-DISTANCE FLIGHTS

[2837] The article by Mr. J. A. Crosby-Warren, of Cambridge, which appeared in your issue of February 23, concerning the utility and otherwise of the long-distance record recently secured by Great Britain in the Fairey Napier monoplane, raises a very interesting point for discussion.

To a mind occupied with the practical side of aviation, the utility of these so-called "flying petrol tanks" may appear to be non-existent, but they must be considered in a broader view.

The fact that Great Britain now holds all three of the important aeroplane records, namely, the fastest, the highest, and the longest, whereas no other country holds one, is in itself a great achievement, and speaks very well for the industry in this country. That British design, material and workmanship is second to none is proved by these flights, and the publicity and advertisement gained for this country's products is surely enough even for a "Student of Aviation."

From the Service point of view, this flight is of great use and interest. It definitely draws our scattered Empire into closer contact, and shows that in a time of peril our farthest Possession can be given assistance from the air in the shortest possible time.

This raises the question of the practically non-existent service load, but it must be remembered that this is only a test flight, and knowledge is gained by experience.

This flight must have been of tremendous use to the designers, and to improve upon the design by increasing the service load and convert the plane into something more useful than a flying petrol tank is only a matter of time and experience, and to gain the latter, theory must be put into practice. When these necessary improvements have been incorporated, then may we look forward with pleasurable anticipation to the time when these flights become an ordinary service exercise.

Nottingham. G. R. HARTWELL-BLACK.
February 27, 1933.

A PLEA FOR THE ENTHUSIASTIC INVENTOR

[2838] I sincerely hope that having taken the lead in expressing the flying community's resentment of the accumulating repressive legislation, you will not be content to let the matter drop until something is done.

The Air Ministry takes the attitude that responsible well-established firms are the only possible sources of advance in flying. True, they can best develop and improve existing ideas, but of their very nature they are not

suited for producing those fundamental inventions by which the great advancements are made. Biologists used to think that new species were the result of gradual improvement by natural selection; it is now known that they are more the result of the unaccountable leaps known as "sports." In human invention the parallel is strict.

The "approved" firms represent the accumulated knowledge of the race, and the natural selection of competition provides for the survival of the fittest. The inventions whereby the great forward leaps are made come from the irrepressible enthusiasm of individuals who will try out ideas that the experienced plodder of great (but never complete) knowledge will not even consider.

Presumably the Air Ministry say that if an individual has an original idea, he has only to submit it to themselves or an approved firm for development.

Well, if that is their idea I can only say with the ancient, "Quem Deus vult perdere prius dementat," and being already afflicted with the first part, may they with all speed suffer the second.

"EXPERIMENTER."

THE LOW-POWER AEROPLANE AND AUSTRALIA.

[2839] As a constant subscriber, I have followed with interest the articles and photos of Mr. Lowe-Wylde's latest venture, the "B.A.C. VII" 2-seater. An article has also appeared in our Press here reporting on its qualities, and there is no doubt it will supply a long-felt want.

The modern trend of designers seems to clap on heavier engines to give their planes better performance, and they sacrifice low landing speed in their efforts.

To the general class of pilot this does not matter, especially the commercial pilot, who regards his pay load and time taken on a job to be of more importance, and quite rightly so.

It is these factors that debar quite a large number of private owners entering the aviation field. At present the "Moth" is the only light plane available (I am speaking of Australia), and its cost here runs into £900 roughly. This is prohibitive to all but a few fortunates.

The advent of Mr. Lowe-Wylde's "Plannette" creates a big sales field, which would be suicidal for English manufacturers to ignore. There are hundreds of young men in Australia who would take up private flying if machines such as those of Mr. Lowe-Wylde's were marketed at reasonable rates.

For one thing, expert tuition, over long hours, would be reduced to a minimum, while maintenance costs would also be low.

Writing a long way from the hub of aviation naturally leads to distorted views, but, to my mind, aviation is at a standstill because the private buyer is not in the market. At present all those who take tuition in flying (except a limited number) do so with the intention of going into aviation as a business.

This narrows the market considerably, and it is to the super-light plane your manufacturers must look to obtain bigger markets.

American firms are beginning to realise this, and agencies have already started selling here a light plane, powered with a motor-cycle engine. According to data to hand, *i.e.*, the Lowe-Wylde "Plannette," it is immeasurably superior in all respects as regards performance to its American prototype.

I have been in communication with this American firm, but am now awaiting details of the "Plannette" before going any further.

A. F. MUNYARD.

Minnivale,
Western Australia.
February 3, 1933.

THAT HELICOPTER AT HESTON

SPECULATION is rife as to the ultimate success of the Austrian Helicopter at Heston. Certain critics have doubted its capability of leaving the ground at all, but they have now been effectively silenced, as both Herr Nagler and Herr Hoffner took the machine off the ground on Saturday morning, March 11. We cannot say that the machine flew unrestrictedly, but it certainly showed that it had ample "lift." The two young inventors are going slowly and steadily to work, and for these early experiments are trying the machine while it is tied to the ground by ropes round its three wheels. Before actually lifting the whole machine in the air they found that the hanging-stick control, which operates a mechanism whereby the incidence of the blades is decreased as they pass the point to which the stick is pushed, is, perhaps, even too sensitive, and for future experiments the effect of this will, so to speak, be geared down. Herr Nagler, in the cockpit, demonstrated the ease with which he could, even when the engine was throttled right back, lift either of the three wheels off the ground and eventually all three at once. At the present time the rotor system of the Helicopter is obviously somewhat unabalanced, and a good deal will have to be done to it before it will operate reasonably free from vibration. Experiments like the present ones are, of course made under somewhat considerable difficulties, as the 40-h.p. Salmson engine being used is air-cooled, and cannot, therefore, be run for more than about 4 min. at a time when the machine is stationary.

Herr Nagler demonstrating the lift of his Helicopter at Heston. The machine is air borne, as the tail wheel is actually clear of the ground as it is in a pit. The rotor system is rigidly braced. (FLIGHT *Photo.*)

Airport News

CROYDON

CAPT. PENNY, of British Air Transport, Ltd., and Mr. G. P. Harrington, a pupil, had an unpleasant experience when their plane came down in the Channel shortly after 6 o'clock on Tuesday evening, March 7. They left St. Inglevert at 6 p.m. for Lympne in their "Gipsy Moth" G-ABEP, and as nothing more was heard of them the Control Tower at Croydon broadcast a wireless message at 7.45 p.m. for information regarding the missing plane. Shortly before midnight, however, a wireless message from the North Foreland radio station stated that two men had been picked up in mid-Channel from a wrecked aeroplane by the Dutch steamer *Vesta*, bound for Amsterdam, and that the aeroplane was lost. The *Vesta* arrived at Amsterdam at 1 a.m., and both the rescued men were handed over to the British Consul, who arranged for their transport back to London by air. In describing what had happened, Capt. Penny stated that shortly after leaving the French coast the engine cut out and could not be restarted. He glided as near as possible to the *Vesta*, then pancaked the machine on the water and both scrambled out on to the tail, where they remained for about twenty minutes before the boat could pick them up.

On Friday, March 10, Imperial Airways had a special charter to Paris for a wealthy racehorse owner, which was carried out by Capt. Dismore in their three-engined Westland.

Two passengers from Batavia who arrived at Amsterdam on Saturday completed their journey to London by Air Union, via Paris, thus avoiding spending the night in Amsterdam to await the next Dutch plane for Croydon or the unsatisfactory alternative of travelling in the old-fashioned way of boat and train after an excellent journey of nearly 9,000 miles by air. They had actually travelled from Karachi to London in 4¾ days, and were so delighted with the trip that they immediately booked a return passage.

Surrey Flying Services had a busy day of pleasure flying on Sunday. The fine weather was responsible for the large number of people who visited the airport. S.F.S. had a special charter to Wolverhampton, which was carried out by Mr. Hancock on Monday, March 13. In the afternoon Mr. Jahn arrived by D.L.H. from Berlin, where he has spent three weeks' leave.

Monday midday, despite a heavy mist which enveloped the airport, Mr. George Watson, of Rollason Aviation Co., Ltd., and Mr. (Bobbie) Montgomery, paid a visit to Mr. Watson's old school at Cranleigh, where they managed with some difficulty to land on the Rugger field (despite the goal posts and mist).

The demonstration "Monospar" (G-ABUZ) has been ordered by R.A.C., the delivery of which is expected by the end of March. It will be used in connection with the British Hospitals Air Fageant tour.

K.L.M. had a record day of bookings on Friday, March 3, when all their machines operating in both directions from Amsterdam-London, Amsterdam-Paris and Amsterdam-Malmo were fully booked.

Every piece of machinery at the Cirrus Hermes works is fully employed and the number of men employed has been doubled during the last fortnight. The new electric starter designed by Mr. Caple (chief designer) is causing considerable interest.

The total number of passengers for the week was 1,064; freight, 58 tons 17 cwt.

"HORATIUS."

FROM HESTON

SEVERAL machines cleared Customs early in the week. Mr. Pugh in a "Spartan" left for Berck, and returned in the afternoon; Flt. Lt. Ivins came from Jersey in his "Bristol Fighter"; Mr. Macpherson came from Leicester in a "Puss Moth," and on Tuesday Mr. Norman Turner cleared Customs in a "Gipsy III" "Moth" for Berck, en route for Kenya. A Banco "Puss Moth" arrived from Davos, and another machine of the same company, piloted by Capt. Styran, cleared from Brussels, having previously called at Warsaw, Vienna and Berlin. The weather was unsuitable for school solos, but two new pupils were taken aloft to a safe height and duly initiated. Flt. Lt. Comper brought a Swift to Heston for a new customer abroad, Dr. Tschudi, and the Dunlop Tyre Co.'s "Puss Moth" came from Coventry.

Wednesday was a good day for flying, and the school machines were busily engaged until dusk. A "Fox Moth" of Hillman's Airways, Ltd., called to pick up the "Paramount" photographer to fly to Southampton for the arrival of Sir Malcolm Campbell. Two Redwings called in the morning, and a pupil, Mr. Davidson, made a successful first solo. A Banco "Puss Moth" left for Sunderland, while the Gaumont photographer was taken in an Airwork machine to Cheltenham for the race meeting; Capt. Birkett also went there on Press work.

Thursday saw three machines off to Paris with some representatives for a squash tournament, while Flt. Lt. Comper cleared for Zurich with Swift "CH-351," and a Hillman's Airways "Puss Moth" left for Cheltenham. Friday was a fair day for the school, and Mr. Clifford left for Brussels, while M. Hanez arrived from Antwerp in OO-GUY. In the evening a message came through that Mr. Bailey, of Air Taxis, Ltd., was expected to arrive at Heston at about 7.30. He came in later than this owing to a strong wind in the west country—he had come from Plymouth—and a tendency to fog near London, but with the aid of the floodlight and a signal flare he landed safely and made a good time to London. At three on the following morning news was received that a Hillman's Airways machine wished to land with photographs urgently wanted in London. It arrived after a ten minutes' wait, and the films were taken to town without delay.

On Saturday M. Meny left early for Paris and M. Hanet arrived from Brussels with two passengers. About thirty machines visited Heston during the day, including M. Ten Bos, in his Pander "PH-AIK."

MORE ABOUT THE GALWAY AIRPORT

ON February 22, Sir Alan Cobham, K.B.E., aviation consultant to the Irish Trans-Atlantic Corporation, which proposes to establish a £3,000,000 international sea and air port on the shore of Galway Bay, visited the site to carry out a survey for the company. He was accompanied by Mr. Maxwell Ayrton, F.R.I.B.A., architect to the promoters. Sir Alan first visited the proposed site at Furbough, which is partly a marshland with a number of very large rocks embedded in it. After a brief inspection he stated that he did not consider this site suitable, and proceeded to an alternative location at Rusheen Point, about three miles from Galway. This, he stated, would be very suitable for the aerodrome, as there were no big obstructions and runways could be constructed in all directions. Part of the land on which Sir Alan Cobham considers the aerodrome should be built would have to be reclaimed from the sea, and the Irish Trans-Atlantic Corporation propose to do this by means of sand pumping. This has already attracted the interest of several Continental firms who are specialists in this type of work.

The area of the aerodrome at Rusheen Point would be

approximately 300 acres, but this could be considerably increased if necessary. It is estimated that the cost of the aerodrome would be £300,000, exclusive of buildings and other works, which are included in the grand total of £3,000,000 for the provision of the extensive harbour and railway connection to the main line to Dublin. The site is bounded on the south by the sea and on the north by the county road leading directly into Galway.

The Irish Trans-Atlantic Corporation propose to convey passengers, landed from Atlantic liners at the deep-water piers to be constructed at the harbour at Furbough, by means of cars or a light railway direct to the aerodrome at Rusheen Point, about four miles away.

Sir Alan Cobham also expressed the opinion while in Galway that a part of the Bay, near to the aerodrome site, would form an excellent flying-boat base, being well sheltered from the heavy Atlantic seas. On the following day Sir Alan, accompanied by Mr. Ayrton and Mr. C. H. Clendining (Managing Director of the Corporation), returned to Dublin and held a conference on the project with representatives of the Civil Aviation Section of the Department of Industry and Commerce.

Several leading Continental engineers have also visited Galway to inspect the site and hold discussions with Mr. Clendining on both the financial and industrial sides of the venture. Mr. Clendining told our Irish representatives that he was quite satisfied with the manner in which negotiations were progressing and that he would shortly be visiting London before proceeding to America, where he is to meet a number of financiers interested in the Corporation and engineering firms who have already expressed a desire to tender for the work to be carried out.

In the meantime permission has been obtained for the use of Oranmore, the old military aerodrome near Galway, as a landing ground for aircraft and two companies are shortly to put services into operation.

DISARMAMENT AND CIVIL AVIATION

An Appeal to the Prime Minister

ON March 9 a letter, signed on behalf of some 49 organisations representing civil aviation, regarding the position of civil aviation in relation to disarmament, was delivered to the Prime Minister, prior to his departure for Geneva. Apart from the important nature of this letter, it is of particular interest in that the signatures were obtained in haste by means of aircraft.

When the enterprise became subject for discussion early last week, the imminent departure for Geneva of the Prime Minister obliged urgent action. Accordingly, two aeroplanes were detailed for the task of gathering signatures from flying clubs, schools and air transport concerns all over the country. Their pilots were to be Flt. Lt. C. S. Staniland and Lt. S. H. G. Trower, R.N., both of whom are normally engaged on the staff of the Fairey Aviation Co.

Flt. Lt. Staniland, in a "Puss Moth" monoplane, took over the northern, and longer, route. Leaving Heathrow aerodrome, Middlesex, early on March 7, he was scheduled to call at Hatfield, Norwich, Skegness, Hull, Sherburn-in-Elmet (Yorks), Scarborough, Newcastle, Edinburgh, Renfrew, Blackpool, Liverpool, Manchester, Nottingham, Leicester and Northampton. Lt. Trower, flying a "Gipsy Moth," was allotted the southern route, with calls at Broxbourne, Southend, Maidstone, Bekesbourne (near Canterbury), Lympne, Shoreham, Ford aerodrome (Sussex), Portsmouth, Hamble, Southampton, Bristol, Cardiff, Reading, and Farnborough. At the conclusion of the journeys the first pilot back was detailed to call at Brooklands, Heston, Hanworth, and Maylands aerodromes, all within the London area. Meanwhile, steps were taken to secure those signatures which were available in London itself.

Three days represented the time limit for completion of the job. Actually, in spite of severe weather conditions—low cloud, rainstorms and adverse winds—the pilots arrived back at Heathrow towards the middle of Wednesday afternoon, March 8, signing was complete by the evening and the letter was delivered to 10, Downing Street less than 36 hours after the pilots began the job.

Flt. Lt. Staniland had covered 900 miles in just over nine hours' actual flying, with fifteen halts along the way, while Lt. Trower's total flying time was more than eight hours, and distance just above 450 miles.

Signatories to the letter comprise the chief aeronautical societies, the flying clubs and schools, and firms engaged in the operation of commercial aircraft. The leading signatures are those of Mr. C. R. Fairey, President of the Royal Aeronautical Society; Col. Mervyn O'Gorman, Vice-Chairman of the Royal Aero Club; Sir John Siddeley, Chairman of the Society of British Aircraft Constructors; Mr. W. Lindsay Everard, on behalf of the Air League of the British Empire; and Maj. J. B. L. H. Cordes, Warden of the Guild of Air Pilots and Navigators of the British Empire.

The letter runs as follows:—

March 8, 1933

To The Right Honourable James Ramsay MacDonald, M.P.,
Prime Minister and First Lord of the Treasury,
10, Downing Street,
London.

SIR,—

We, the undersigned, representing the entire flying movement of Great Britain, feel compelled to ask for certain assurances from you because of the anxiety with which we view efforts which, under the guise of attaining disarmament in the air, are being made to place strictures on civil aviation, strictures that can only hamper its legitimate development and—in particular—react unfavourably on the enviable position secured by this country in the sphere of air transport and private flying.

Though we have every confidence in the ability of the British delegates to the Disarmament Conference to maintain a steadfast front towards any suggestions that might have repercussions on the safety of the Empire and the peaceful progress of British air transport, we believe that there is some ground for fear that well-intentioned efforts to arrive at a measure of political agreement may be permitted to override the British case, so admirably and clearly stated to the Air Committee of the Conference by the Secretary of State for Air, and ably supported by the Under-Secretary.

This country has built up by years of hard work a technical lead in the design and construction of aeroplanes and aero engines, which is the envy of other nations. Only recently a British aeroplane has wrested the third "supreme" flying record from its previous foreign holders; never before have the world records for speed, height and distance resided in one country.

Our regular air transport services are drawing steadily nearer to the point where they will "fly by themselves" and the need for any form of government support be passed into history. The British Empire is unique in comprising territories in nearly every part of the world; no other nation can possibly have interests commensurate with ours. Free and unhampered air transport is essential for quick Imperial communication, even perhaps for the continued unity and safety of the Empire.

Further, after a period of some years, there is also a fair prospect that air lines may be operated with success over many routes inside this country.

Other branches of civil aviation, such as air touring for business and pleasure and aerial survey, have suffered inevitably from the world depression of the past few years, but though the number of civil aircraft registered in this country is still small, more touring is done by British aircraft than by those of all the other European countries put together. We may fairly claim that the British aeroplane and the British pilot have done at least as much as the matériel and personnel of any other nation to demonstrate the incalculable benefits that aviation has in its power to confer upon the world at large and upon the British Empire in particular.

In confirmation of the assertion that our position in aviation is the admiration of the world, we would cite the lead in the export trade in aircraft matériel which this country has maintained against the fiercest opposition for the past four years. That lead, representing a direct contribution to the credit side of the British balance of trade, and employment for thousands of skilled workers, depends on a maintenance of the system which has produced it and on unfettered opportunity for further expansion.

May we respectfully ask, therefore, for your personal assurances on the following points:—

(1) That in no circumstances will the British delegates to the Disarmament Conference be empowered to reach agreements which do not comply with the conditions laid down by the Marquis of Londonderry in his speech at Geneva on February 20?

(2) That His Majesty's Government will bear incessantly in mind the unique position of the British Empire in aviation while considering any proposals for the imposition of yet more control on the activities of British commercial and private flyers?

(3) That no proposals which would restrict the normal progress of civil aviation, either by interference with the liberty of the designer or by hampering the free progress over all parts of the world of the flying vehicle, will receive the slightest measure of support from His Majesty's Government.

(4) Finally, that in no circumstances will confused thinking on the subject of military and naval aviation and the influence of powerful vested interests be permitted to react disadvantageously on the legitimate expansion and freedom of any branch of British Civil Aviation.

We hope and trust that these and many other points of great importance to the future of British air communications may already have received the closest consideration from yourself and from the members of your Government. In the belief that you would appreciate some expression of opinion on a subject which is of vital import to the whole flying community of this country, we have ventured to address this letter to you.

We have the honour to be, Sir,
Your obedient servants,
etc., etc.

(*List of Signatories attached*)

Airisms from the Four Winds

A Very Plucky Airman

MR. VICTOR SMITH, the young South African airman, has tried three times to set up a new record for the Cape flight, and three times has he failed, the third time by but a paltry 160 miles. Leaving Lympne at 2 a.m. on March 9, Mr. Smith arrived at Perpignan at 7.40 a.m., left at 8.45 a.m. and arrived at Oran at 1.17 p.m., leaving again at 2.10 p.m. Next day he left Beni Abbes at 5 a.m. and reached Reggan at 8.30 a.m. on the same morning. From Reggan he flew on to Gao, leaving this latter place at 3 in the afternoon. On Saturday, March 11, he reached Niamey, and left there for Duala. On March 12 he arrived at Benguella at 6 a.m. and left at 8.25 a.m. (local time), arriving at Mossamedes at 10.26 a.m. At 5.20 the same evening he arrived at Walvis Bay, and left again at 6.40 p.m. He passed over Alexander Bay, 350 miles north of Cape Town, at 12.25 a.m., at which time he was well ahead of Mrs. Mollison's record. Unfortunately Mr. Smith, after leaving Walvis Bay, ran into heavy head winds, and realised that he was running short of petrol. Eventually he was forced to land at Vanrhynsdorp. He landed without hurt to his machine, but apparently was unable to obtain petrol in time to enable him to fill up and carry on to Cape Town at once. So Mr. Victor Smith has failed by a very small margin to beat the record for a flight to the Cape, which is a great pity, for his pluck deserves better luck. The Comper "Swift," fitted with a Pobjoy "R" engine which Mr. Smith was flying, is no less worthy of praise, because high winds forced the machine down in the last 160 miles. If the engine and machine are capable of standing up to a flight of 5,900 miles, they are both capable of lasting out 6,000 miles, so the praise due to the machine and engine is in no way lessened because the pilot failed by so short a margin to reach his objective.

Annual Report of German Aviation Union

THE Deutsche Luftfahrt-Verband, Germany's largest aviation union, has just published the report on its development during 1932, which is altogether gratifying. The number of associated clubs has risen from 840 to 912. Owing to the economic depression, however, membership numbering 60,000 has not further increased. The union's fleet of aeroplanes has increased by 20 to 170, which during 1932 executed 113,330 flights and flew for 20,828 hours, covering a distance of 2,082,800 kilometres (approximately 1,300,000 miles). The number of trained motor pilots has increased from 1,200 to 1,573. Thanks to the motor-car starting method evolved by Wolf Hirth, "sail-flying" has developed particularly well, and the number of machines, the overwhelming majority of which was built by members, has risen from 934 to 1,200. It is interesting to note the social standing of the gliding pupils who have last year passed the "B" and "C" gliding tests. Of these 531 belonged to the working class, 523 were scholars still attending school or university students, 423 belonged to other professions (clerks, etc.) and 286 were intellectual workers. This clearly demonstrates the popularity of the movement in Germany, which has taken a firm hold on every class of the population. Considering the German Aviation Union is not subsidised in the same manner as are the clubs in other nations, the achievements are brilliant.

E. P. A. H.

Houston Everest Expedition

THE Houston Everest Expedition (whose progress has been reported in previous issues of FLIGHT) arrived at Karachi on March 7. The s.s. *Dalgoma*, carrying the Westland machines, arrived on the following day, and these were removed to the R.A.F. depôt for assembling. Lord Clydesdale and Flt. Lt. McIntyre flew to Delhi to inspect aerodromes in preparation for the flight across India. On March 10 they proceeded to Purnea, where the main base of the expedition will be established. On March 13 Lord Clydesdale, Col. Blacker and Flt. Lt. McIntyre, who were returning to Karachi from Purnea, left the Expedition's "Fox Moth" secured by pickets on the aerodrome. During the night a storm arose which tore the machine from its moorings and carried it 100 yds., damaging the wings, airscrew and fuselage.

A Lagonda Rally

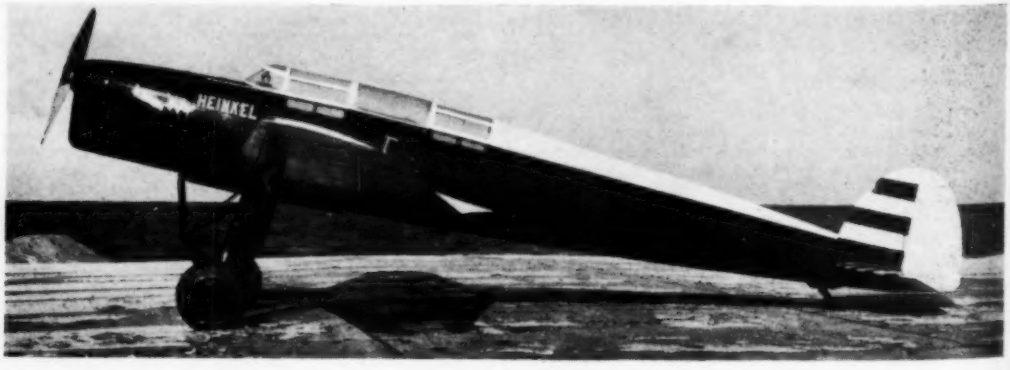
THE Lagonda Car Club are holding a Rally at Hanworth Air Park, Feltham, on Saturday, March 25, at 2 p.m., to which all Lagonda owners are welcome. An attractive programme of car events has been arranged, and various pilots have promised to attend and give a flying display.

Flying at Ford

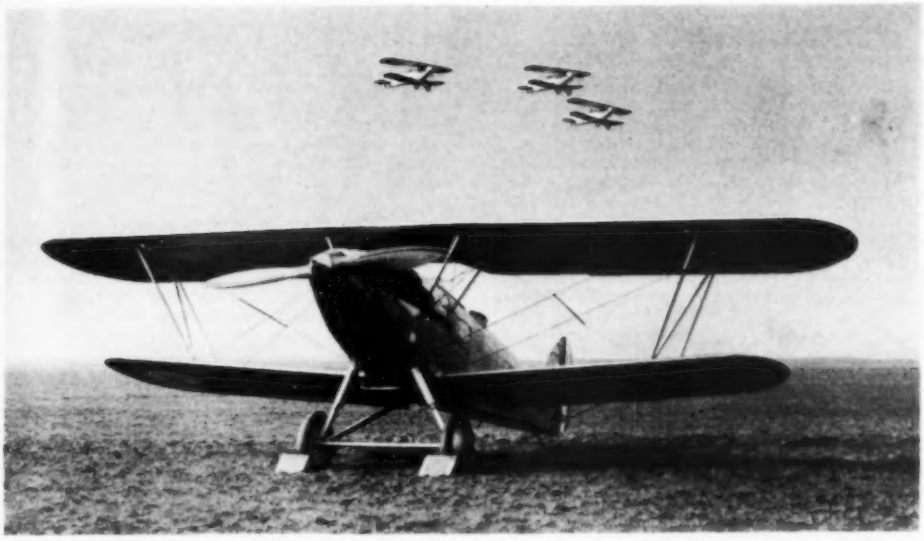
CAPT. ROLLASON reports a busy week-end at Ford where the weather conditions were ideal and business was almost up to mid-summer standard. Two Desoutters were fully engaged on joyflights, while three "Moths" were used for school work and advanced dual tuition was given on a Bristol "Fighter." Two press photography jobs were also carried out. Amongst a number of visitors who arrived during Saturday and Sunday were Mr. Gordon Selfridge and Flt. Lt. Christopher Clarkson. One N.F.S. "Moth" arrived. For the convenience of visiting pilots and their friends a motor car is kept at Ford Aerodrome by R.A.C.

Early Supermarine Ownership

OUR reference the other day to the remarkable work of Mr. Hubert Scott-Paine in connection with motor boat racing in general, and the challenge for the British International Challenge Trophy in particular, should have noted that Mr. Scott-Paine was the sole owner of the Supermarine Aviation Works at the time when he disposed of his interest in them, *i.e.*, during what may be termed the "post P.B." period.



A HEINKEL FOR ENGLAND: This He.64 is coming to this country shortly, where it will be used for experiments in control at large angles. The tall undercarriage has been designed to enable the machine to be landed at large angles. The engine is a "Gipsy III." Handley Page, Ltd., are interested in the machine.



LONDON AUXILIARIES RECEIVE "HARTS"

Nos. 600 and 601 Squadrons have now had their new machines issued.

IT was decided last summer to re-equip some squadrons of the Auxiliary Air Force with Hawker "Harts" ("Kestrels") in place of the "Wapitis" which have hitherto been the standard equipment of all the squadrons of this force. The two squadrons selected as the first recipients of the "Hart" are No. 600 (City of London) and No. 601 (County of London) Bomber Squadrons. These squadrons are commanded by Sqd. Ldrs. Nigel Norman and S. B. Collett. The re-equipment of the two squadrons has now been completed, and the officers of the two squadrons are busy at Hendon getting used to flying the new type. (FLIGHT *Photos.*)

Using the R.A.F.

A GROUP of Unionist Members of Parliament headed by Rear Admiral Sueter and Capt. Balfour have put a motion on the Order Paper urging that there should be no further increase in Naval expenditure without the setting up of an impartial committee to report how far the services now performed by Naval Forces could be carried out by the substitution of the Royal Air Force and what economies could be achieved.

Export of Aircraft to China and Japan

LT. COL. J. COLVILLE, Secretary to the Overseas Trade Department, explained, in answer to a question in the House of Commons on March 8, that "the embargo on the exportation of war material from this country to China and Japan does not apply to aircraft of any kind. While it is true that aircraft and aircraft engines are mentioned in the Arms Export Prohibition Order, 1931, an open general licence was issued on June 1, 1931, authorising the exportation of aircraft and aircraft engines to all destinations other than Abyssinia. This open general licence still remains in force."

Nomenclature of Aircraft—Hart (Communication)

THE Air Ministry announces the official name of the "Hart" aeroplane modified for communication purposes is "Hart (Communication)." This name is to be used in all correspondence and reports relating to this type of aeroplane.

An Aerial Sign Post

WITH regard to the paragraph published in last week's issue of FLIGHT concerning the painting of the word "Frome" on top of the new gasholder in that town, we understand that this work has not yet been completed, but will be finished in the course of the next few weeks.

THE R.A.F. IN KURDISTAN

SOME little attention was drawn in the press last summer to a rebellion at Barzan, Kurdistan, against the authority of the Iraq Government. An account of this campaign and of another earlier one in the same region was given to the Royal United Services Institution on Wednesday, March 8, by Group Capt. A. G. R. Garrod, M.C., D.F.C., who is well known in air circles as a recent Chief Instructor of the Oxford University Air Squadron. Air Chief Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., was in the chair. The lecture was illustrated by an unusually excellent set of slides, which gave a very vivid idea of the mountains in the Mosul district of Iraq.

The first operations, or campaign, were those against Shaikh Mahmud from October, 1930, to May, 1931, and the second were against Shaikh Ahmad of Barzan from December, 1931, to June, 1932. In each case it had been originally decided that the main part was to be played by the Iraqi Army, which it was felt must prove itself able to undertake responsibility for the security of the country. Small R.A.F. detachments were to carry out reconnaissance, but not to act as a striking force.

Shaikh Mahmud was described by the lecturer as a sportsman and a scoundrel. He had been pro-Turk in 1918. We had, however, put him in control of the village of Sulymania. He rebelled; we sentenced him to death, but, in fact, only exiled him. Then we reinstated him on terms, but he again proved faithless. When we signed a treaty to retire from Iraq at the end of 1930, he thought he would have another shot at making himself King of Kurdistan, and invaded the area round Sulymania. The villagers, however, did no more than tolerate him.

He commenced by a series of attacks on police posts and captured one. The Iraqi Army attempted to round him up, and performed some very fine marching feats, but Shaikh Mahmud constantly evaded them. This sort of campaign would have tried the abilities of a very experienced army, and that of Iraq was a new creation. The rebellion extended, and the Shaikh made capital out of the absence of the British, who he declared were favourable to his cause. One weak police post was invested, and then the Iraq Government asked for air action by the R.A.F. Two flights were sent to the district. Three rebel villages were duly warned, evacuated, and then destroyed by the aircraft. This saved the police post. Then a special mobile column of the Iraqi Army took up the pursuit, with a British officer in command. The R.A.F. reconnoitred for it. The rebels were located in a certain village, and the column made a fine march of 30 miles and attacked it. Mahmud fled and was hunted through the hills into Persia. Then he saw that all was lost, so came in and surrendered. He was put in an aeroplane and flown off to Ur.

The Barzan campaign was different, because Shaikh Ahmad was the established and tyrannous ruler of a district situated very strongly among the hills and very difficult to attack. At first the Iraqi Army scored a success, but later, while marching through the mountains, the rebels made a flank attack on the mule transport. The muleteers were civilians, not enlisted soldiers like the courageous *drabis* of the Indian Army. They naturally fled in panic, and a serious situation developed. The British officers with the column and some Iraqi officers succeeded in restoring order, but the baggage had been lost. Supplies were then dropped by the aircraft. The Iraq Government then asked the R.A.F. to suppress the central rebel area. It meant flying over frightfully difficult country, and one machine had a forced landing and the pilot and observer were taken prisoners. They were well treated and soon released. On May 25 air action began in earnest with the dropping of a practice bomb. The policy was not to take life or destroy property, but to keep the villagers out of their villages and upset their normal life. Day and night small bombs were regularly dropped on the villages, and after three weeks the families of the villages began to leave the district. Ahmad fled across the Turkish border and was arrested by the Turks. A notable feature of the last phase of operations was the use of a loud speaker in a "Victoria" which broadcast propaganda in the local dialect with marked effect.

Group Capt. Garrod said that the art of air control was to produce results without doing damage. Political officers were very necessary in the area during operations, and time must be given to the tribesmen to make up their minds to surrender. When they do, the fruits of victory must be promptly seized. These operations showed that air control does not need large objectives.

It must be some time since the R.U.S.I. has listened to such an interesting and well-composed lecture by an officer fresh from the scene of operations.

ENGINE COOLING RESEARCH

IN the paper which he read before the Royal Aeronautical Society on March 9, Mr. R. McKinnon Wood, O.B.E., M.A., Assoc.M.I.C.E., F.R.Ae.S., confined himself to the air-cooled engine of the future as he imagined it a few years ago. It was not possible to estimate exactly the fraction of the developed power which was spent in cooling by exposed cylinders, but he thought that at 180 m.p.h. the fraction was something like one-third. The comparable figure for the water-cooled engine with retractable radiator appeared to be about one-eighth.

The conception of the air-cooled engine of the future was on the following lines: The cross-sectional area would be reduced; reduction gearing would assist in this; the cylinders would be generally of existing form, but side valves behind the cylinders would help to keep the cylinder heads clean for cooling purposes; cylinders would be given the maximum practicable fin area and would be enclosed in sheet metal jackets through which the cooling air would flow; the ducts would be carefully shaped to minimise loss of energy by avoiding sharp curves and rapid expansions; the circulation would be partly or wholly produced by an airscrew fan driven by the engine through gearing, revolving at 3,000-4,000 r.p.m.

On the subject of relative efficiency of flight flow (*i.e.*, flow produced by the forward speed of the machine) and fan flow, the lecturer inclined to the opinion that fan flow would be distinctly more efficient for the quantity of flow required to cool an engine. Secondly, the fan might increase almost indefinitely the limits, which we were now approaching, of cooling that could be supplied in existing cowling installations. Thirdly, the fan would give a means of adjusting the cooling. Fourthly, the fan offered an automatic regulation of the cooling to suit the flight speed.

The lecturer then dealt with experiments on air cooling, for which, however, we have not the space here. As a result of these experiments Mr. McKinnon Wood came to the following general conclusions:—

It had not been proved that fan induction was more efficient than flight induction for the rate of flow required, but, on the other hand, a strong case could be made for the fan as a means of giving more cooling if flight induction failed, as an easy means of adjusting the cooling, and as providing a large measure of automatic regulation. The work done in forcing air over cooling surfaces, even in an idealised model, was much greater than the ideal skin friction loss, and here further study was required. In addition, it was important to look into every possible means of reducing the speed of flow required for cooling. The road was clearly a long one, but the lecturer thought it was worth travelling.

New London Air Port

A COMPANY has been formed recently with the name of Central Air Ports, Ltd., with the object of building an air port over the railway sidings behind King's Cross and St. Pancras stations—a scheme to which we have referred on several occasions. Sir Alfred Beit, M.P., has been appointed chairman, and the estimated capital needed is £5,000,000.

THE ROYAL AIR FORCE

London Gazette, March 13, 1933

General Duties Branch

The follg. are granted permanent commns. as Pilot Officers with effect from February 24 and with seny. of February 5, 1932 :—P. Y. Davoud, A. J. Kennedy. The follg. Pilot Officers on probation are confirmed in rank :—L. W. Oliver (February 22) ; A. Franklin, M. C. Moore, J. J. Watts (March 4).

P/O. L. F. Brown is promoted to rank of F/O. (January 25) ; Lt.-Cdr. J. B. Heath, R.N., Flt.-Lt., R.A.F., ceases to be attached to R.A.F. on return to Naval duty (February 3). The follg. Flying Officers are transferred to Reserve, Class A (March 2) :—A. M. Cowell, A. Haywood, A. D. Jaffé, R. V. Redpath.

Lt. (now Lt.-Cdr.) F. G. Wynne, R.N., F/O., R.A.F., relinquishes his temp. commn. on return to Naval duty (June 2, 1930) (substituted for *Gazette* June 17, 1930) ; F/O. A. L. T. Naish is transferred to Reserve, Class C (July 1, 1932) (substituted for *Gazette* July 5, 1932).

Stores Branch

F/O. on probation A. Wall is confirmed in rank (January 8) ; P/O. on probation S. W. Needham is promoted to the rank of F/O. on probation (January 8).

Memorandum

The permission granted to Lt. J. H. Taylor to retain his rank is withdrawn on his conviction by the Civil Power (June 3, 1930).

ROYAL AIR FORCE RESERVE

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. are granted commissions as Pilot Officers on probation in Class AA (i) (March 8) :—G. N. Beckmann, J. H. Hoggart-Hill. F/O. G. B. K. James relinquishes his commn. on account of ill-health (March 8). *Gazette*, February 7, concerning Flt.-Lt. J. B. Stockbridge is cancelled.

SPECIAL RESERVE

General Duties Branch

F/O. J. Sillery relinquishes his commn. on completion of service (February 22) ; F/O. V. O. G. Bell resigns his commn. (February 20).

AUXILIARY AIR FORCE

General Duties Branch

No. 608 (North Riding) (Bomber) Squadron.—Sqdn.-Ldr. W. H. Davies resigns his commn. (February 20).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Group Captain R. Leckie, D.S.O., D.S.C., D.F.C., to Station H.Q., Hendon, 1.3.33, to Command and on appointment as Superintendent of R.A.F. Reserve, vice Wing-Com. W. J. Y. Guilfoyle, O.B.E., M.C.

Wing Commanders : S. R. Watkins, A.F.C., to Station H.Q., Andover, 23.2.33, to Command, vice Wing-Com. F. H. Coleman, D.S.O. P. C. Sherren, M.C., to No. 1 Armament Training Camp, Catfoss, 28.2.33, to Command. W. Sowrey, D.F.C., A.F.C., to No. 3 Armament Training Camp, Sutton Bridge, 28.2.33, to Command. J. W. Woodhouse, D.S.O., M.C., to No. 2 Armament Training Camp, North Coates Fitties, 28.2.33, to Command. D. G. Donald, D.F.C., A.F.C., to H.Q., R.A.F., India, 11.1.33, for Air Staff duties vice Wing-Com. C. C. Durston (deceased). K. M. St. C. G. Leask, M.C., to H.Q., R.A.F., India, 2.2.33, for duty as Senior Equipment Staff Officer, vice Wing-Com. A. Gray, M.C.

Squadron Leaders : C. Boumphrey, D.F.C., to Air Armament Sch., Eastchurch, 28.2.33, for Officers' Armament Course. H. M. K. Brown, to Air Armament Sch., Eastchurch, 28.2.33, for Officers' Armament Course. W. E. G. Bryant, M.B.E., to Air Armament Sch., Eastchurch, 28.2.33, for Officers' Armament Course. E. R. Openshaw, to Air Armament Sch., Eastchurch 28.2.33, for Officers' Armament Course. A. L. Paxton, D.F.C., to No. 25 (F.) Sqdn., Hawkinge, 28.2.33, to Command, vice Sqdn.-Ldr. W. E. G. Bryant, M.B.E. H. Cockerell, O.B.E., to Air Ministry, Dept. of the Air Member for Personnel (D. of T.), 28.2.33, for Air Staff (Armament) duties, vice Sqdn.-Ldr. G. A. H. Pidcock. C. R. Carr, D.F.C., A.F.C., to R.A.F. Depot, Middle East, Aboukir, 15.2.33, for duty as Adjutant, vice Sqdn.-Ldr. C. E. W. Foster. C. E. W. Foster, to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 15.2.33, for Flying duties, vice Sqdn.-Ldr. H. E. Walker. H. B. Russell, A.F.C., to No. 8 (B.) Sqdn., Khormaksar, Aden, 6.2.33, to Command. H. G. Bowen, M.B.E., to H.Q., R.A.F., Middle East, Cairo, 28.2.33, for Air Staff Intelligence duties, vice Sqdn.-Ldr. J. H. Green.

Flight Lieutenants : E. P. Mackay, to No. 3 (F.) Sqdn., Upavon, 22.2.33. G. E. G. Lywood, to Air Armament Sch., Eastchurch, 27.2.33. P. L. P. Marett, to No. 32 (F.) Sqdn., Biggin Hill, 24.2.33. R. J. P. Morris, to Air Armament Sch., Eastchurch, 28.2.33. H. G. Sawyer, A.F.C., to Marine Aircraft Experimental Estab., Felixstowe, 27.2.33. H. D. Spreckley, to Air Armament Sch., Eastchurch, 28.2.33. C. E. H. Allen, D.F.C., to No. 1 Sch. of Tech. Training (Apprentices), Halton, 27.2.33. I. G. E. Dale, to No. 45 (B.) Sqdn., Helwan, Egypt, 15.2.33. R. H. Donkin, to No. 1 Sch. of Tech. Training (Apprentices), Halton, 1.3.33. H. A. Evans-Evans, to No. 6 (B.) Sqdn., Ismailia, Egypt, 6.2.33. L. K. Barnes, to No. 203 (F.B.) Sqdn., Basrah, Iraq., 28.2.33. G. W. Birkinshaw, to No. 4 Flying Training Sch., Abu Sueir, 28.2.33. J. C. A. Johnson, to H.Q., Iraq Command, Hinaidi, 28.2.33.

Flying Officers : R. J. R. H. Makgill, to No. 99 (B.) Sqdn., Upper Heyford, 13.2.33. A. N. I. Worger-Slade, to No. 15 (B.) Sqdn., Martlesham Heath, 20.2.33. E. S. D. Drury, to Air Armament Sch., Eastchurch, 28.2.33. H. Ford, to Air Armament Sch., Eastchurch, 27.2.33. M. L. Heath, to Air Armament Sch., Eastchurch, 28.2.33. J. A. H. Louden, to Air Armament Sch., Eastchurch, 27.2.33. A. O. Molesworth, to Air Armament Sch., Eastchurch, 28.2.33. W. B. Bailey, to No. 16 (A.C.) Sqdn., Old Sarum, 20.2.33. J. C. Macdonald, to Air Armament Sch., Eastchurch, 27.2.33. B. A. Oakley, to No. 18 (B.) Sqdn., Upper Heyford, 27.2.33. D. G. W. Somerville, to No. 9 (B.) Sqdn., Boscombe Down, 2.3.33. W. J. F. Bull, to No. 14 (B.) Sqdn., Amman, Palestine, 28.2.33. A. R. Collins, to No. 30 (B.) Sqdn., Mosul, Iraq, 28.2.33. P. E. Drew, to Station H.Q., Heliopolis, Egypt, 28.2.33. W. N. Elwy-Jones, to No. 45 (B.) Sqdn., Helwan, Egypt, 28.2.33. A. D. Grace, to No. 30 (B.) Sqdn., Mosul, Iraq, 28.2.33. H. R. Graham, to No. 45 (B.) Sqdn., Helwan, Egypt, 28.2.33. L. T. Jearey, to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 28.2.33. J. C. Larking, to No. 55 (B.) Sqdn., Hinaidi, Iraq, 28.2.33. T. G. Lovell-Gregg, to No. 30 (B.) Sqdn., Mosul, Iraq, 28.2.33. N. W. Mackenzie, to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 28.2.33. J. B. S. Monypenny, to No. 55 (B.) Sqdn., Hinaidi, Iraq, 28.2.33. J. O. W. Oliver, to No. 55 (B.) Sqdn., Hinaidi, Iraq, 28.2.33. J. B. Sims, to No. 45 (B.) Sqdn., Helwan, Egypt, 28.2.33. G. F. A. Skelton, to No. 30 (B.) Sqdn., Mosul, Iraq, 28.2.33. W. W. Stainthorpe, to No. 84 (B.) Sqdn., Shaibah, Iraq, 28.2.33. M. R. D. Trewby, to No. 70 (B.T.) Sqdn., Hinaidi, Iraq, 28.2.33. W. H. N. Turner, to No. 45 (B.) Sqdn., Helwan, Egypt, 28.2.33. E. B. Waddy, to No. 20 (A.C.) Sqdn., Peshawar, India, 28.2.33. H. McC. White, to No. 31 (A.C.) Sqdn., Quetta, India, 28.2.33. S. C. Widdows, to No. 45 (B.) Sqdn., Helwan, Egypt, 28.2.33. C. W. Williams, to No. 84 (B.) Sqdn., Shaibah, Iraq, 28.2.33.

Pilot Officers : A. R. Glencross, to No. 101 (B.) Sqdn., Andover, 21.2.33. V. G. Govett, to No. 10 (B.) Sqdn., Boscombe Down, 23.2.33. R. A. C. Barclay, to No. 39 (B.) Sqdn., Risalpur, India, 28.2.33. G. A. Bartlett, to No. 5 (A.C.) Sqdn., Quetta, India, 28.2.33. J. Bradley, to No. 14 (B.) Sqdn., Amman, Palestine, 28.2.33. W. R. Brotherhood, to Aircraft Depot, Karachi, India, 28.2.33. C. S. Byram, to No. 14 (B.) Sqdn., Amman, Palestine, 28.2.33. G. H. Denholm, to No. 70 (B.T.) Sqdn., Hinaidi, Iraq, 28.2.33. J. F. H. du Boulay, to No. 11 (B.) Sqdn., Risalpur, India, 28.2.33. M. H. Dwyer, to No. 31 (A.C.) Sqdn., Quetta, India, 28.2.33. W. J. H. Ekins, to No. 14 (B.) Sqdn., Amman, Palestine, 28.2.33. D. R. Evans, to No. 45 (B.) Sqdn., Helwan, Egypt, 28.2.33. K. F. Ferguson, to No. 14 (B.) Sqdn., Amman, Palestine, 28.2.33. D. H. Furze, to No. 28 (A.C.) Sqdn., Ambala, India, 28.2.33. P. I. Harris, to No. 6 (B.) Sqdn., Ismailia, Egypt, 28.2.33. P. A. Hunter, to No. 6 (B.) Sqdn., Ismailia, Egypt, 28.2.33. W. A. W. Jameson, to No. 208 (A.C.) Sqdn., Heliopolis, Egypt, 28.2.33. D. V. Johnson, to R.A.F. Depot, Middle East, Aboukir, 28.2.33. J. W. B. Judge, to No. 6 (B.) Sqdn., Ismailia, Egypt, 28.2.33. H. G. Leonard-Williams, to No. 208 (A.C.) Sqdn., Heliopolis, Egypt, 28.2.33. T. A. B. Parselle, to No. 208 (A.C.) Sqdn., Heliopolis, Egypt, 28.2.33. J. C. Pope, to No. 27 (B.) Sqdn., Kohat, India, 28.2.33. P. S. Salter, to No. 27 (B.) Sqdn., Kohat, India, 28.2.33. A. A. Shaw, to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 28.2.33. R. H. Shaw, to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 28.2.33. J. J. A. Sutton, to No. 6 (B.) Sqdn., Ismailia, Egypt, 28.2.33. J. N. H. Whitworth, to No. 70 (B.T.) Sqdn., Hinaidi, Iraq, 28.2.33. F. W. L. Wild, to No. 208 (A.C.) Sqdn., Heliopolis, Egypt, 28.2.33. J. Worrall, to No. 208 (A.C.) Sqdn., Heliopolis, Egypt, 28.2.33.

Stores Branch

Squadron Leader J. S. Browne, A.F.C., to H.Q., Inland Area, Stanmore, 27.2.33, for Stores Staff duties, vice Sqdn.-Ldr. F. H. Sims.

Flight Lieutenants : O. G. Ridley, M.C., to Station H.Q., Biggin Hill, 27.2.33. W. F. Langdon, to Aircraft Depot, Hinaidi, Iraq, 28.2.33.

Flying Officer F. C. Read, to Supply and Transport Services, Iraq, 28.2.33.

Accountant Branch

Squadron Leader W. R. Westcombe, to No. 2 Flying Training Sch., Digby, 25.2.33, vice Sqdn.-Ldr. P. Hay.

Flying Officers : J. R. Ackers, to Station H.Q., Hinaidi, 10.2.33. J. Lambie, to No. 45 (B.) Sqdn., Helwan, Egypt, 15.2.33.

Medical Branch

Flight Lieutenant G. O. Williams, to No. 26 (A.C.) Sqdn., Catterick, 2.3.33. For duty as Med. Officer.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty :—

Lieut.-Comr. (Flt.-Lt., R.A.F.)—R. G. Poole, re-attached to R.A.F., and appointed to *Victory*, for R.A.F. Base, Gosport, for course (March 19).

Lieut. (F/O., R.A.F.).—A. C. R. Duvall, to *Leander*, for 407 Flight (March 10).

Royal Air Force

Pilot Officer.—F. H. Tyson, to *Glorious*, for No. 408 (F.F.) Flight (March 2).

ROYAL AIR FORCE : VACANCIES FOR APPRENTICE CLERKS

The Air Ministry announces :—Vacancies exist in the Royal Air Force for well-educated boys (in possession of an approved first school certificate) between the ages of 15½ and 17 to enter as apprentice clerks in April and July next. Entry will be by selection from among applicants with the necessary additional qualification. Detailed information regarding the apprentice clerk scheme can be obtained from the Secretary, Air Ministry (Apprentice Clerks Department), Gwydyr House, Whitehall, London, S.W.1. Successful candidates will be required to complete 12 years' regular Air Force service after reaching the age of 18. At the age of 30 they will normally return to civil life, but a limited number may, subject to service requirements, be permitted to re-engage to complete 24 years' service qualifying for pension. Boys entered under this scheme will be trained up to the age of 18 (or the completion thereafter of the prescribed course) in clerical duties, typewriting, practical office routine, shorthand (for Clerks, General Duties), pay and store accounting (for Clerks, Accounting). During this period their general education is continued under a staff of graduate teachers. An apprentice clerk at present receives pay at the rate of 1s. a day for the first year and 1s. 6d. a day afterwards, i.e., until he has both attained the age of 18 and successfully completed the course. Thereafter pay is at present issuable at rates commencing at from 3s. to 4s. 6d. a day (21s. to 31s. 6d. a week), according to the degree of success achieved at the final examination. Free board and lodgings and an allowance for uniform are provided.

BRITISH AIRCRAFT ABROAD: The Blackburn "Ripon" of the Finnish Air Force in which a Bristol "Pegasus" engine was flown under service conditions for 100 hours.

BRISTOLS ABROAD

OFFICIALS of the Finnish Air Force have been greatly impressed by the excellent results achieved in Finland with a Bristol "Pegasus L" type aero engine. The engine, which had previously run for 304 hr., was fitted in Finland into a Blackburn "Ripon" aircraft and was flown under service conditions for 100 hr. It was then dismantled for examination, and its splendid condition was the cause of highly complimentary remark by the leading engineers of the Finnish Air Force: "The strip is much better than other engines after only 100 hr." "I am very pleased I saw it myself, otherwise I should not believe it." These were the remarks of two of the responsible officials.

The excellent results achieved with this British engine have demonstrated to Finland the excellent service which can be secured by fitting this British engine, and as a result negotiations with the Finnish Government have been completed in conection with a substantial order for the supply of Bristol "Pegasus" air-cooled aero engines designed and manufactured by the Bristol Aeroplane Co., Ltd., of Filton, Bristol. The engines comprise units of the Bristol "Pegasus L" and Bristol "Pegasus M" types, which vary in respect of the degree of supercharge incorporated for operation at altitude. The "Pegasus L," for instance, is rated at 590 B.H.P. at 2,000 r.p.m. at 1,500 ft., and 645 B.H.P. at 2,300 r.p.m. at 2,500 ft., whilst at similar r.p.m. the "Pegasus M" delivers 555 B.H.P. at 4,500 ft. and 625 B.H.P. at 5,500 ft.

The Lithuanian Government has also just placed an order for the supply of eight Bristol "Pegasus L" aero engines. This decision is the result of a close investigation conducted by the Lithuanian authorities into the merits of the various engines available, and it is a recognition of the excellence of this British engine that it should have been chosen from many competitors.

Since the new series of Bristol "Pegasus" and Bristol "Mercury" engines were placed upon the market some months ago they have been widely adopted and are in service in many countries. As a result of the insistent demand for the supply of the new "Bristol" engines from so many quarters is that the extensive engine works of the Bristol Aeroplane Co., Ltd., have, for some time past, been working day and night to endeavour to cope with definite orders in hand.

The latest foreign order comes from Denmark, the Government having placed an order for the supply of fourteen "Pegasus" air-cooled aero engines for the equipment of the Royal Danish Flying Troops. For some years past this Air Force has fitted its various new aircraft with engines of the "Jupiter" type, and a recent acquisition covered the supply of Bristol "Bulldog" single-seater fighters, similar to those in service in R.A.F. squadrons.

Air Service Training Activities

THE number of pupils under training during February has increased by the arrival of Messrs. Talbot, Whetham and Soule—the last named from Canada—to take the three years' course, of Ali Khan Aga to take his ground engineers' licences, of Flt. Lt. Loch taking the wireless course, and of Mr. Pickett for advanced flying training. Messrs. Lee, G. Kennedy and Mehta completed all the tests and examinations for their "B" pilots' licences, and Mr. Hollins satisfactorily completed his blind flying course and is to be awarded the A.S.T. blind flying certificate. In connection with the land and seaplane training of the Royal Air Force Reserve, which the school undertakes, visits were received from Group Capt. Leekie, the Superintendent of the Reserve, and Wing Com. Guilfoyle. In the course of the month the chief instructor, Flt. Lt. Jenkins, gave a series of lectures at the Central Flying School, Wittering, on the use of the blind flying apparatus, recently purchased from A.S.T. by the Air Ministry for use at the C.F.S. The very fortunate situation of the school as regards flying weather was emphasised during the recent stormy conditions, as flying was carried on almost constantly. During the month squash matches were played with Royal Air Force teams from Worthy Down and Gosport, the Tennis Court Club, Leamington, and against Col. Martyn's team at Knowle.

NEW COMPANIES REGISTERED

COTSWOLD AERO CLUB, LTD.—Capital, £500 in £1 shares. Objects: to form and carry on an aero or flying club, etc. Directors: Arthur W. King (chairman), Mill House, Westgate Street, Gloucester (director of Westgate Motor House Co. (Gloucester), Ltd.. Wm. R. Walwin, Sunnymede, Upton Lane, Barnwood, near Gloucester. Denis Foot, St. Catherine's Vicarage, Heathville Road, Gloucester. Secretary: Denis Foot. Solicitor: G. W. Treasure, St. John's Chambers, Gloucester.

MIDLAND & SCOTTISH AIR FERRIES LIMITED.—Capital £20,000 in £1 shares. Owners of aeroplanes and other aerial craft, seacraft both for sailing and flying, motor vehicles, air ports, aerodromes, landing places, slipways, hangars, workshops, garages, etc. Directors: John C. Sword, Craigweil, Ayr (general manager); Mrs. Christina G. Sword, Craigweil, Ayr (Scottish Co.).

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors.

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1931

Published March 16, 1933.

21,067. PIONEER INSTRUMENT CO., INC. Electrical indicating apparatus for directional compasses. (388,085.)

APPLIED FOR IN 1932

Published March 16, 1933.

493. A. RUPP. Hubs for airscrews. (388,174.)

8,624. L. R. GRUMMAN. Retractable landing-gear. (388,226.)

19,543. W. C. L. HAUBROE. Coupling-device for synchronizing gears for controlling fire of aircraft machine guns. (388,285.)

22,771. B. J. E. KROOK and J. HARDEN. Devices on aircraft for producing smoke screens. (388,318.)

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